Established 1914

CHEMICAL MARKETS

VOLUME XXX NUMBER 4

Contents for April, 1932

CHEMICAL MARKETS *is indexed regularly in the* INDUSTRIAL ARTS INDEX

CHEMICAL MARKETS, Inc., Publishers

Publication Office, 28 Renne Ave., Pittsfield, Mass. Editorial and General Office, 25 Spruce St., New York City

WILLIAMS HAYNES, PRESIDENT; D. O. HAYNES, JR., VICE-PRESIDENT; WILLIAM F. GEORGE, SECRETARY-TREASURER

PUBLISHED ON THE TENTH DAY OF EACH MONTH AT PITTSFIELD, MASS. SUBSCRIPTION, DOMESTIC, TWO DOLLARS FIFTY CENTS A YEAR, IN ADVANCE, CANADIAN AND FOREIGN, THREE DOLLARS; SINGLE COPIES, CURRENT ISSUE, 25 CENTS; BACK COPIES, 50 CENTS EACH. NOTICE OF THREE WEEKS IS NECESSARY TO CHANGE SUBSCRIBER'S ADDRESS AND IN WRITING PLEASE GIVE BOTH THE OLD AND NEW ADDRESSES. PRINTED FOR THE PUBLISHERS BY THE SUN PRINTING COMPANY, PITTSFIELD, MASS. ENTERED AS SECOND CLASS MATTER, JANUARY 1, 1928 AT THE POST OFFICE AT PITTSFIELD, MASS., UNDER THE ACT OF MARCH 3, 1879.

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Gold and the Chemical Future

Since the publication of his economic criticism of the Versailles Treaty, J. M. Keynes has displayed an uncanny foresight of the course of events. In 1925 he forecast the present depression and predicted that it would be attributed to all sorts of irreconcilable causes—"to the industrial disputes which will accompany it, to the Dawes Scheme, to China, to the inevitable consequences of the Great War, to tariffs, to high taxation, to anything in the world except the general monetary policy which set the whole thing going."

Recently Mr. Keynes has predicted the destruction of the creditor position of France, and possibly of the United States also, within the year, due to the loss of reparations and interest payments plus the handicap of high exchange with countries which have forsaken the gold standard.

This prophet has been so frequently correct in his predictions that his opinion deserves particular attention, and he believes that this radical shift in the world's gold position would end the present economic stalemate either by opening the way to capital expenditures with a rise in commodity prices or by general default of debts and the disappearance of the present credit system.

Chemical leaders can sympathize with the crucial importance he places upon the fall of commodity prices. "The mere expectation of prices continuing to fall destroys the incentive to produce" and this aggravates a situation which he does not conceive as the result of overproduction, but as a too rapid appreciation in the purchasing power of gold. He would have us use, whenever possible and in every way possible, the world's full potential production, and he considers the real obstacle to recovery the dead hand of old indebtedness, which as prices fall increases its claim upon the output produced by the labor and capital of the world. "There is a degree of deflation which no bank can stand" and he believes that point will soon be reached. If Mr. Keynes' predictions again come true much of the blame for the trouble and losses of the depression will eventually be found due to the bankers' passion for liquidity, which has depreciated industrial assets and checked the expenditures of consumers.

Political Economy With all the dignity and courage of a darkey passing a graveyard at midnight, the House of Representatives side-stepped the sales tax, and then preceded to levy excise duties on a wide variety of articles ranging from automobiles to matches. The result is the crazy patch-work of taxes, the revenue of which is doubtful; the inconsistency and complication of which are obviously going to be very great. At the time this is written, it is impossible to forecast the fate in the Senate of the tax measure now before Congress, but so far, the whole procedure has been a rather pitiful display of political cowardice.

So very little effort has been made to effect any real economies in Government operations, and so very great pains have been taken to saddle taxes, at least ostensibly, upon rich individuals and business, that Congress has succeeded admirably in shattering the financial morale of the country and creating an extremely unfavorable impression abroad. Nor is the matter closed yet. For, even if the budget is apparently balanced, there is plenty of wild talk in Washington of bonus bills, and bond issues for public works; and even for a direct dole for the unemployed, that it almost appears as if Congress were trying its very best to impair the credit of the country and check our economic recoveries. The pity of it is that they have it within their power to do these destructive things at a time when the country so greatly needs far-sighted, courageous leadership.

Chemical Unemployment We need not point out to our readers that there is a serious unemployment problem in the chemical industry and that at this stage it is fast becoming critical among the white collar employees of the sales and the research staffs. The remarkable statement that "there are but two hundred and seventy-five chemists of standing out of work" which the New York newspapers credited to the President of the American Chemical Society amused our chemical industrialists as much as it disturbed our industrial chemists, and it is therefore, quite useless for us to quote the impressive statistics of chemists unemployment which have been thrust upon us by Relief Committees in various sections of the country. Among the general public, however, such a statement must have created an extremely erroneous impression and very seriously embarrassed several hard-working, public spirited groups of technical men who, are striving to alleviate what is real distress among their professional brothers.

Most particularly unfortunate is the phrase "chemists of standing." It is a cruel blow at men who, in the vast majority of cases, are the victims of circumstances beyond the control even of their late employers. Under the circumstances it means nothing but it implies that unless a chemist is a member of the American Chemical Society, for the President was presumably quoting official statistics, he is an unqualified and backward individual, a sort of shyster among our technical men. It is to be granted that most progressive chemists are members of this or other professional societies, for the benefits are many and generally acknowledged; but we are certain that from the very most capable members of the A. C. S. will come the first and most vigorous protests against this Pharisaical attitude. We are not initiate to the inner circles of A. C. S. policies; but to an outsider it seems that they have not recognized the chemists' unemployment problems as a great opportunity for service. Their official statistics of unemployment appear ridiculous to those familiar with the actual situation. They are openly accused of refusing to co-operate with eight other national, technical societies in a joint relief effort, and it is said that the efforts of their local Sections in this direction have not been helped by headquarters. The kindest explanation is that a Secretariat in Washington (the city where there is so little unemployment) and membership composed so largely of teachers of chemistry (the group among whom there have been so few "cuts") fails to sense the gravity of the situation. Nevertheless to members of discernment and fine feeling all this smacks very distastefully of an attempt on the part of an organization that boasts it is the largest and financially strongest of all chemical technical societies in the world to exploit a distressing situation by hooking up unemployment relief with a drive for additional members.

Fertilizer Intentions Fertilizer sales curves are in close alignment with those of gross farm income, and the parallelism is almost perfect if the charts are plotted for the principal crops of the largest fertilizer consuming states. At first glance this seems natural enough; but it reveals a fundamental misconception on the part of the farmer as to the most economic use of plant foods. This misconception is serious drain upon agricultural prosperity and it is all but

fatal to the profitable operation of the American fertilizer industry.

Fertilizer on the average American farm is used to step up production. Fertilizer ought to be used to cut down costs.

This is a distinction that makes a real difference. Fertilizer is plant food. Its function is to increase the productivity of land; but there is a vast difference in whether this function is employed to double the crop on a given acreage or to grow the same crop on half the number of acres. A dime is ten cents, but as the founder of the Rothschild dynasty pointed out years ago, there is very wide mental and financial gulf between the man who regards ten cents as one per cent interest on a dollar for a year and the one who considers it just a couple of nickels. If the intelligent agressive "upper ten" of our farmers could be brought to consider fertilizer as an efficient economical and — barring vagaries of the weather — a certain means of increasing their net income by reducing their land and labor costs, there is no doubt but that the farm problem *pre se* would solve itself and the consumption of fertilizer, at a fair price and upon decent credit terms, would increase to a point where the fertilizer industry's problems be clarified and simplified and profitable operation might become a reasonable expectation.

The Ides of March Four price changes of the past month are of more than passing interest to consumers of industrial chemicals. Calcium acetate advanced fifty cents per hundred pounds, from $2.00 to $2.50. Before the slump the quotation was in the neighborhood of $4.50. The hardwood distillation industry was faced with rapidly increasing surplus stocks and the severe price decline became inevitable. Stocks on hand increased in 1930 from 11,483,936 pounds at the end of January to 19,266,386 pounds at the end of December. In only four months did shipments exceed production. Likewise in the first three months of 1931 production exceeded shipments and by the end of March stocks mounted to 28,687,087 pounds. The balance of the year shows, however, that shipments far exceeded production so that by the end of December the preliminary surplus stocks figure is reported to be only 8,733,949 pounds. With the increase in the price of lime, acetic acid manufacturers have been forced to adjust their prices upward.

Producers of zinc oxide announced sharp price reductions in March. This is clearly a case of delayed adjustment. Zinc is selling at the lowest price in history and the decline has been in force for many months. Until now oxide producers have not felt the necessity of following closely the trend of the metal market, but competitive products have been radically deflated and the inevitable finally caught up with the price situation of the oxide.

Of greatest importance, perhaps, is the once radical reduction of boric acid from $125 a ton to $85 and of borax from approximately $50 a ton to $36 a ton. The borax industry has gradually wrought a revolutionary change in its status, from that of a fine chemical with extremely limited tonnage to that of an industrial chemical marketed in huge quantities. The borax industry itself has largely been responsible for this transformation by seeking out entirely new uses, increasing productive capacities, and passing on to consumers and prospective consumers the large part of the savings effected by mass production methods. The largest single user of borax today is the vitrous enamel field and its swift growth has to a large extent been aided by lower borax prices. About fifty per cent of the common glass industry is now thoroughly convinced of the ultimate savings, higher efficiency and superior products possible with the addition of borax to the mix. The latest reduction in borax cannot fail but to stimulate present users to increase their consumption and will go along way towards convincing the remainder to adopt it.

Business has entered that slow and painful process of readjustment. A part of this process will be the re-establishment in the minds of buyers of the fact that economical worth is found in value and not in price.—*William Zinsser*

Fifteen Years Ago

(From our issues of April 1917)

Dr. William Beckers is busy working out plan for the $20,000,000 amalgamation of Wm. Beckers Aniline, Schoellkopf Aniline and Chemical, National Aniline, and Standard.

Spencer Kellogg & Sons complete a plant at Edgewater, N. J. for crushing copra.

DuPonts acquire Harrison Bros. & Co.

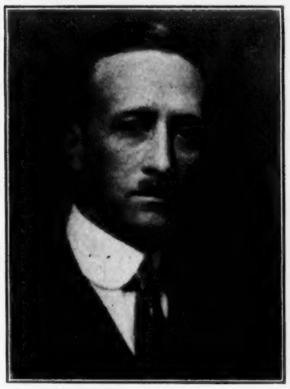
Secretary of the Interior states that the Government will require 6,000,000 tons of sulfuric acid for war purposes for the year.

DuPonts purchase additional nitrate fields in Chile.

C. Wilbur Miller, president, Davision Chemical is representing the Manufacturing Chemists' Association on the committee which has been formed to increase the output of sulfuric acid for war purposes.

"Capital Costs" vs "Labor Costs" in the Chemical Industry

By C. R. Downs, Ph. D.



THE perfect chemical process is continuous and automatic both as to operation and control. Obviously, such a process employs a minimum of both manual and technical labor. Ever since 1920 determined efforts have been made to reach this ideal operation, and during the past two years these efforts have been redoubled. Unless the future holds another era of easy inflation, production costs will continue to command the close attention not only of the management, but also of the research and operating staffs of our chemical industries.

In chemical operations these direct influences upon technological unemployment extend beyond the confines of chemical industry itself. Since the first introduction of chemical bleaching back in the early stages of the Industrial Revolution, the employment of chemicals and chemical processes in all sorts of fabricating industries has resulted in marked savings of time and of labor. The past decade has seen a great extension of chemical processes, and for obvious and well-known reasons, we, all of us expect a constantly greater use of chemicals during the coming ten years.

It is plain therefore, that chemical technique and chemical products alike are bound to be closely identified with the problems of technological unemployment. And while it is a well-known fact that the labor costs in most of the older chemical industries are comparatively an unimportant item in the production budget, nevertheless, these problems are certain to have lasting effects in a number of our most important chemical consuming fields.

In chemical circles two easy-going, optimistic beliefs have been commonly held regarding technological unemployment. The first is an old economic fallacy, namely, that every labor-saving device, by reducing the cost of goods, releases sufficient purchasing power to buy other goods thereby creating a new job for each one that it abolishes. The second is a sort of chemical alibi to the general effect that chemistry by creating new industries such as lacquer, rayon, plastics, etc., has in reality absorbed more workers than were ever displaced by the use of any labor-saving chemical process in any field.

On the face of it, the first conclusion is erroneous. A technological improvement which releases men from one industry or operation, does not create additional purchasing power, but a surplus of potentially productive man power. In other words, the displacement of labor means only that the same quantity of goods may now be made at lower cost. Not until the replaced labor is back again at work, is purchasing power increased.

No practical industrialist but recognizes that a labor-saving device widely introduced creates a new situation with regard both to the supply of labor or the demand for labor. It may release older men, or men skilled in a certain operation, or men capable of doing heavy type, physical work. On the other hand it may create a new demand for a special type of mental or physical worker, especially the former. Plainly it requires a mechanic to operate an automatic conveying mechanism that replaced a gang of laborers and wheelbarrels, while a trained chemist at a higher wage may be required to operate a continuous chemical process formerly carried on by non-technical "process men." In any event this change in personnel renders the existing wage scale more or less obsolete, and it is observed that labor-saving devices or labor-saving processes may make the existing level of wages too high at least for the physical worker. Inventions which become active factors in technological unemployment are efficient enough to reduce the cost of production and hence eventually the price of the goods manufactured. They tend to necessitate a lowering of money wages for many classes of labor, otherwise

it would pay manufacturers to use such a large proportion of capital and such a very small proportion of labor in their production, that the number of workers increase more rapidly than the number of jobs. In other words, in any industry where new machines and improved processes are lowering costs, hence prices, real wages (wages expressed in purchasing power, not dollars) are apt to be rising rapidly. But when prices are rising, this tendency of technological progress to advance real wages is counterbalanced largely by the tendency for money wages to lag behind other prices. If on the other hand the price level is falling, the tendency for technological improvements to increase real wages too rapidly, is materially strengthened by this same lag of wages behind prices in general.

Provided that the forecast of economists and industrialists that prices are more apt to decline than advance during the next decade is fulfilled, then, it is obvious that, under these conditions, unemployment from technological causes is apt to increase. Moreover, a protracted period of declining prices is certain to prompt even more strenuous efforts to save labor costs, and the disparity created in this way between real wages and other prices will become greater and greater so that technological unemployment problems promise to become more and more serious. Only the development of new industries could relieve this situation but this relief can only be temporary because of the almost certain adverse effects in other fields. For example, if air conditioning as predicted is universally adopted, the necessity for summer vacations and insect window screens will be seriously modified during the hot summer months. The ramifications of any innovation of this sort are extremely complicated and result in unforseen economic disturbances which puts a premium on the alertness of the industrialist.

Adjusting Wage Scale to Prices

During the past century, the price of consumers' goods has steadily declined while wages have been increased and working hours have been shortened. This movement has been quickened since the war and very violently accelerated since 1929, so that the maladjustment between wages and prices presents at once critical problems in industrialist and the worker while it furnishes the most potent incentive for technological developments aimed to lower labor costs still further. How are our industries, working upon reduced production schedules and selling at lower prices, to re-absorb the labor laid off during the depression, and looking forward a few years, continued to re-absorb the labor displaced by technological improvements ?

It is a serious question for we are plainly committed to a program of progressively improving manufacturing technique through research, and no executive dare to ignore or supress new developments. Competition, especially in chemical industries, forces progress. Not only is improved technique the best competitive defence and the surest means of increasing profits; but the costs of improvements are also in the main paid by the public, that is, by those whose property and occupations are rendered obsolete. Again technological changes are stimulated. In boom times all the efforts of the sales and manufacturing departments are expended in filling the demand for goods. Likewise part of the activities of the research department is devoted to the task of assisting this production. Only under depressed conditions do the sales and research departments seek new uses and the production and research staffs work whole heartedly for lower costs.

Rapidity of Change in Chemical Industry

The powerful combination of influences promoting technological change very plainly creates unemployment, but is it not possible that they have also been in part responsible for the excess capacity of our chemical industries ? If more efficient use of machines causes labor to be overpriced in relation to capital and results in technological unemployment, then capital should be underpriced and in great demand. Yet we actually find that we have an excess of plant capacity, or unemployment of capital. This is painfully true at the moment, but it was partly true during the prosperous years of 1922-28 when there was no section of our standard industrial chemical production that worked its apparatus to capacity. The only exceptions—and these but temporary—were among the new chemical products or synthetics, such as lacquer, plastics, and fibres. The rapid developments in new chemical products and in new chemical processes and in the entirely new industries often closely related to these new chemical techniques, created a great demand for new capital. Often these new projects—rayon and ammonia are prominent examples—require heavy equipment investment, and especially in the newer chemical fields technological developments come so fast that they render apparatus obsolete before it has had any chance to operate at full and efficient capacity. In other words, in our chemical industries, where we have to reckon with both new products and new processes, technological changes are so rapid and so far-reaching that both capital and labor may be the victim of technological unemployment. A wiser course for the future obviously lies in development which will employ existing equipment more fully by creating new and greater outlets for products now economically produced.

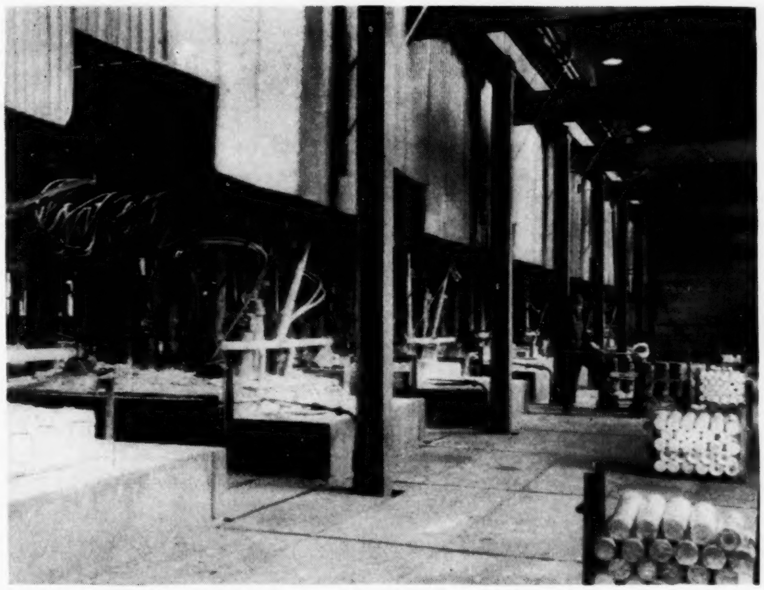
Discovery of large fields of high-grade phosphate of lime at Palabora, North-Eastern Transvaal is expected to result in extensive South African fertilizer industry. Deposit, it is reported, has yielded samples of much higher value than obtained from any other South African field. South African Phosphates, has been floated with a capital of £54,156 in 10s. shares, and has an option over a block of 1,730 claims.

From Laboratory to Market

The Story of Magnesium Metal*

By John A. Gann, Ph.D.†

OUR American magnesium industry really dates from 1915, since an earlier enterprise at Boston had long since been discontinued. The General Electric Co. was the first of the new producers. The Norton Laboratories at Nashua, N. Y., and later at Lockport, N. Y., and the Electric Reduction Co. of New York City likewise produced magnesium during the latter part of 1915. Production was begun this same year by Shawinigan in Canada. The next few years witnessed the appearance of several new companies, including the Aviation Materials Corp. at Niagara Falls, the Magnesium Manufacturing Corp. at Rumford, Maine, the American Magnesium Manufacturing Corp. at Niagara Falls, and the Dow Chemical Co. at Midland, Mich. and likewise the elimination of several from the list of producers due to cessation or consolidation. In 1917 there were five producers, but by 1920 only two remained, the American Magnesium Corp. and the Dow Chemical Co.



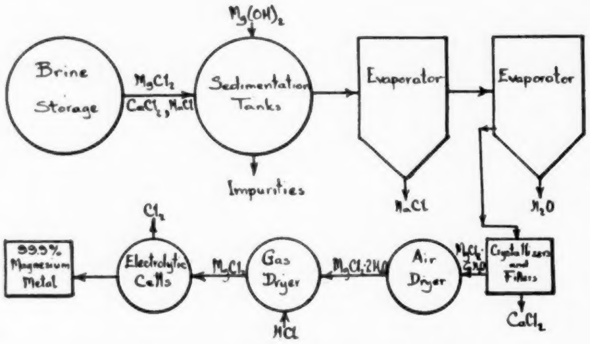
Plant at Midland is now producing magnesium in large commercial quantities. Photograph shows a battery of electrolytic cells. They consist of large rectangular cast steel pots, the lower portion of the cells being submerged below the operating floor level and are built into stoker-fired furnaces

The imports of German magnesium began to increase about this time. Cheap labor in an established industry allowed exportation at a price lower than domestic cost. In 1922, imports were more than three times as large as the consumption of domestic magnesium. The American industry might have been greatly retarded, if not completely strangled, had it not been for the protective tariff imposed on the metal during this same year. Two years later (1924) came the suspension of the Elektron Metals Corp., formed to exploit the German product in this country, and in May 1927, the American Magnesium Corp. ceased the manufacture of ingot metal and confined its activities primarily to the casting and fabrication of magnesium and its alloys. It has been reported recently that the American Magnesium Corp. and the German I. G. have united.

The Dow entry into the magnesium industry in 1916 was due primarily to the abundant supply of magnesium chloride in the salt brine that forms the basis of its various chemical processes. A method for the commercial extraction of this salt had been completed and the product placed on the market at the crucial moment when the war suddenly stopped importation of German magnesium and magnesium chloride. The local product thus became the raw material for many companies then beginning the production of the metal. Although progress in the manufacture of magnesium chloride has been so extensive that the earlier methods and plants have been completely replaced, two equally great problems con-

*Abstracted from an address delivered before the American Institute of Mining and Metallurgical Engineers.
†Chief Metallurgist, Dow Chemical Co.

fronted us, namely, a method for converting this magnesium chloride into a suitable cell-feed material and a suitable electrolytic cell. These problems were attacked simultaneously since the progress in one often depended upon the success of the other.



• Magnesium Metal Production Flow Sheet •

The brine containing magnesium chloride, calcium chloride and sodium chloride is treated with magnesium hydrate slurry to precipitate iron and other impurities which are removed in sedimentation tanks. The sodium chloride is then separated by evaporation and filtration. Further evaporation, coupled with a series of fractional crystallization steps separates the calcium chloride from the magnesium chloride

Magnesium chloride normally contains six molecules of water of crystallization, more than 50 per cent by weight of the crystals. Such material in the electrolytic cell resulted in low operating efficiency. A portion of this water would be decomposed by the current, thereby needlessly consuming power, and another portion would instigate a number of very undesirable chemical reactions. The obvious solution was to remove the water by drying, but direct heating resulted in decomposition of magnesium chloride into magnesium oxide. This necessitated indirect dehydration methods.

The first method for making anhydrous magnesium chloride was the so-called sal ammoniac process, evaporating a solution of ammonium chloride and magnesium chloride to crystallize out a double salt having the formula, $MgCL_2.NH_4CL.6H_2O$. This salt could be air dried to remove about five molecules of water and the final dehydration effected by fusing the air dried salt in suitable pots. Ammonium chloride was thus sublimed off along with the removal of the last molecule of water, leaving a clear melt of anhydrous magnesium chloride.

Early History of Commercial Production

Having made a few pounds of this product in hastily improvised equipment, attention was directed towards electrolysis. The first cell consisted of a small rectangular box welded out of boiler plate, lined with slabs of soapstone. A soapstone partition divided the box into two compartments at the top, leaving the lower part open for the whole length. An iron plate was inserted in one compartment and a graphite rod in the other and these two electrodes connected with a direct current from a low voltage generator. This crude cell was heated up in a brick arch until it was thoroughly hot. Molten magnesium chloride was then poured in and the current turned on.

Much to our surprise the cell actually began to produce magnesium metal as small globules floating in the molten salt. The current was approximately 120 amperes at a potential of 10-12 volts. With this power input it was possible to maintain the salt bath in a molten condition at a bright red heat. Although this occurred on one of the hottest days of one of the hottest summers experienced in Midland, the experiment was continued all night. Morning brought its reward in the form of a one pound pancake of metallic magnesium.

Continued operation taught several important lessons. The addition of common salt to the magnesium chloride lowered its melting point and increased its conductivity. The addition of a little flourspar helped to coalesce the small globules of molten magnesium to a large mass, thus facilitating its removal from the cell. The best way to remelt the magnesium was to use some of the fused cell bath as a flux. This procedure with certain refinements forms the basis of present day melting and scrap reclamation processes.

After the first experimental cell had been operated for some weeks, a semi-plant unit was constructed. This consisted of a 400 ampere cell and setting, a low voltage motor set, generator, a brick furnace and subliming chamber for the production of anhydrous magnesium chloride, and a melting pot for remelting and purifying the magnesium. This unit operated for several months with varying success. When things went smoothly, as much as 10-12 pounds of metal were made in a day. Polarization of the anodes caused considerable trouble. The remedy was simple enough after once discovered and consisted in maintaining the cell bath in a suitably fluid condition by holding the proportions of magnesium chloride and sodium chloride between the limits of approximately 40-60 per cent. Chlorine was another difficulty. Sometimes it persisted in boiling out of the anode compartment in spite of all precautions and everyone was driven outdoors.

This work continued on into the winter through a wet and soggy fall. The building was saturated with magnesium chloride which had violatilized out of the cells and melting pot and settled over everything. Here it commenced to absorb water and in a short time anything in the building which could not be kept warm was covered with a dirty, slimy coat of magnesium chloride. Even clothes became saturated and were uncomfortable to wear. Nevertheless a few hundred pounds of the metal was gradually accumulated.

Progress had been steady and it was decided to build a commercial plant. Accordingly the engineers and chemists got busy with pencil and slide rule and

soon some very fine designs appeared on the drafting board. A series of 25 cells was proposed so as to use the 300 volt D. C. current available in the plant. An array of tanks, crystallizers, evaporators, filters, was laid out. Plans were made for a large internally-fired rotary kiln dryer and a battery of 8 foot cast iron fusion pots for the final dehydration. After several months, a large building was erected and the equipment installed. It was a fine job of construction and as far as paper plans went the plant should have worked perfectly.

In the autumn of 1917 this plant was ready to start. After a few days run, a sufficient supply of anhydrous magnesium chloride had been provided and the work of starting cells began. There were 25 cells in series, each holding 300-400 pounds of molten salt and kept hot by oil burners. Difficulties began to develop. Some cells became too hot: others persisted in freezing up. Some of the cells were short circuited by the accumulation of metal. Chlorine leaks occurred and made the air almost unbearable for the workmen. Finally a few cell-pot castings cracked and allowed the molten charge to run out on the floor. Nothing could be done but but cut those cells and continue with the survivors. Herculean efforts failed to keep the plant in condition and a shut-down resulted.

Such experiences were disheartening, but valuable from the standpoint of lessons taught. They helped design a better cell. They showed that the sal ammoniac process for producing anhydrous magnesium chloride was beset with many objections. The ammonium chloride recovery was poor; equipment handling the ammonium chloride solution suffered from corrosion; and the fusion pots had a short life. It was, therefore, decided to abandon this process and dismantle the plant. This was the writer's introduction to magnesium on the occasion of his first trip through the Dow plant.

The "Double Salt" Method Tested

The next cell developed was both simple and a success. It consisted of a round bottom, cast steel pot that served as a cathode. A large graphite electrode was suspended centrally and the fireclay flue liner surrounding the anode formed a chamber for collecting the chlorine gas. This cell held approximately 800 pounds of molten cell bath, operated on 3,000 amperes, and produced 50-60 pounds of magnesium per day. The feed was made by the "double salt" method. Hydrated magnesium chloride was carefully air dried until approximately four of its six molecules of water had been driven off. This partially dehydrated magnesium chloride melted with an equal weight of sodium chloride at a temperature considerably below the melting point of the pure salts, thus largely preventing decomposition of the magnesium chloride into magnesium oxide and hydrochloric acid. The resultant product contained approximately 60 per cent $MgCl_2$ and 40 per cent NaCl.

This "double salt" as a cell feed resulted in an accumulation of sodium chloride in the cell since only magnesium chloride was consumed in the electrolysis. As the sodium content increased, the bath became sticky and viscous, and soon the cell would not function properly. Continuous operation, therefore, necessitated periodic dipping of part of the cell-bath back into the fusion kettle and replenishing with fresh feed. This mode of operation worked although it was difficult to keep an accurate check on the composition of the cell bath. Control depended largely upon experience and judgment of the operator who could tell from its physical appearance whether or not its composition was approximately right.

Disheartening Experiences With New Plant

The success of this new cell prompted construction of a new plant. Another series of cells and fusion kettles was provided, together with all necessary equipment. A few cells started off propitiously and soon all were producing metal. Difficulties multiplied, when it was attempted to control the bath composition in so many units by this periodic dipping method. Nevertheless the plant operated at a current efficiency of 60-70 per cent, considered fairly successful at the time.

The finish of this second plant came with dramatic suddenness. One morning a large fusion kettle cracked and its charge of molten salt ran across the floor. Wooden roof supports and working platforms in the path of this hot salt immediately set fire and in a few minutes the entire building was ablaze. The structure was gutted. The only thing salvaged in undamaged condition was a pile of magnesium ingots which had been covered up by debris when the roof fell.

The suddenness of this catastrophe was another set-back in the faltering development of magnesium manufacture at Midland. When the curtain finally did rise again we had another series of four or five of the 3,000 ampere cells with structural improvements thriving on a feed of anhydrous magnesium chloride instead of the mixed chlorides, eliminating the dipping evil. This material was the product of another extensive research and was prepared by partial drying in air and completing the dehydration in an atmosphere of hydrochloric acid gas. There were still difficulties evidenced by the escapes of hydrochloric acid; and a mixture of hydrochloric acid and chlorine gases cannot be recommended as an atmosphere for work. The cells, however, were kept in continuous operation for a period of months and required relatively little supervision or operating labor.

It began to look as though a method of producing anhydrous magnesium chloride and a suitable cell

had at last been evolved which could be combined in a practical working plant for large scale manufacture. Once more, plans were under consideration for a considerable increase in production, but again progress was slowed up, not by difficulties or disaster, but by the financial crash of 1920. Curtailment, not expansion, followed and within a few months there was a complete shut down.

Development in Markets Necessary

We had 20,000 pounds of magnesium which proved sufficient inventory for over a year. Production on a small scale was again started in the fall of 1921 using the process of manufacture last described, but demand continued small until after the 1922 tariff became effective. During the few years following, many improvements were made, but larger units could not come until the market for magnesium had been developed. The last few years have witnessed such changes. Individual units in certain stages of our present dehydration process have capacities equivalent to better than 20,000 pounds of metal per day. Cells of many thousands ampere capacity are successfully operated. They are worthy descendents of the first 120 ampere cell that required a day to produce a single pound of metal. These large cells have permitted many refinements, such improvements being reflected in a purer, cheaper metal.

The small globules of magnesium form on the side of the cathode and rise to the surface of the bath where they collect into a coherent mass. Metal is periodically dipped and cast into ingots. This magnesium without further treatment analyzes 99.93 per cent pure, one of our purest commercial metals. The average analysis shows the following impurities:

Al	0.022	Per Cent
Fe	0.034	" "
Mn	0.002	" "
Si	0.012	" "
Total	0.070	" "

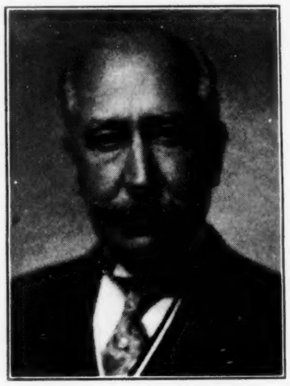
Support of Dr. Herbert A. Dow

This picture of the development of the magnesium industry and more specifically of the role our company has played would not be complete if we did not mention two names indelibly engraved in this work, namely, the Dr. Herbert H. Dow, and E. O. Barstow, one of our production managers. Endowed with determination and faith in the ultimate outcome, they bravely met adversity and repeatedly proved that necessity is the mother of invention. During the discouraging pioneer stages and the depression following the World War, magnesium was often tried in the balance and probably would have been judged wanting had it not been for the way they championed its cause.

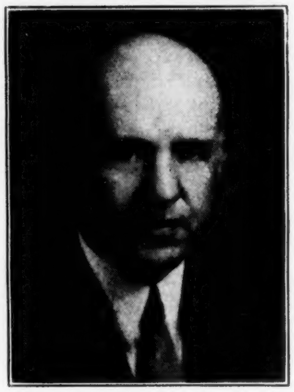
We Congratulate ---

William M. Rand, April 7, 1886
Marston T. Bogert, April 18, 1868
Warner D. Huntington, April 18, 1874

It is popularly credited that the Merrimac operations contributed their full quota to the remarkable earnings of Monsanto during 1931, and the man who is at once the treasurer and the sales manager of those operations doubtless did his bit. Both friends and competitors of "Billy" Rand will all sustain this contention, for he is known to be one of those executives who sees clearly and acts consistently. He is honest, frank, and friendly. He knows chemicals and New England has known him since the time when he was Captain of the Harvard track team and ran the "440" in the Olympics. May his stride continue to lengthen!



It is difficult to distinguish whether Colonel-Professor Bogert is the diplomat of the chemical corps or chemist of the diplomatic corps, for he has conspicuous contributions to his credit both as publicist and scientist. His many activities include such widely separated interests as cancer research and the chemistry of perfumes; consultant to the Chemical Warfare Service and Trustee of the Museum of Peaceful Arts; the Century Club and the Megantic Fish Corporation. May his activities multiply, for he always adds something to whatever cause or study engages his enthusiasm.



Warner D. Huntington deserves a whole series of congratulations this year. He has moved from Baltimore to New York. His many years of distinguished public service to the chemical industries through the National Fertilizer and the Manufacturing Chemists' Associations has been crowned by important work and recognized by an important office. He has capped his business career as successively sales manager of the Jarecki Chemical Co., of the Buffalo Fertilizer Co., of the Davison Chemical Co. with taking charge of the sales of the fertilizer division of the Cyanamid Co. April 19th he will be sufficiently acclimated to enjoy thoroughly a good golf holiday. We hope the sun shines brightly upon him.

General American Tank Car has perfected a tank car known as the Dry-Flo, which handles granular commodities as conveniently and efficiently as standard tank cars now handle liquid commodities. This car, which conforms to all the requirements of the American Railway Association, has been enthusiastically received by those who have had this car in trial service, and it is believed will open new vistas in transportation savings, which savings will not be at the expense of the already harassed railroads.

Interpreting the Rise in the Price of Acetate of Lime

DOES the recent increase of fifty cents per hundred pounds for calcium acetate forecast the return of a higher chemical price level? For years acetate of lime was to many a price barometer of industrial chemicals generally. Its decline in importance has, however, detracted from its weight as an indicator, and the severity of the decline in production during the past four years has been impressive. In 1928 production totaled 101,270,760 pounds; 1929, 112,764,816 pounds; 1930, 77,199,410 pounds and 1931, 40,658,221 pounds. It should be remembered, however, that total production or shipments for 1931 are abnormal and do not in any event represent the long time trend. While synthetic acetic acid production is undoubtedly cutting into the sale of lime, the above figures also represent an effort on the part of producers to correct a very serious condition of surplus stocks at a time when consumption is naturally greatly reduced from the average for the past ten year period.

In January 1930 the stocks in hand at the end of the month amounted to 11,483,936 pounds. In but four months of that year, June, October, November and December did shipments exceed production. The high point in stocks on hand was reached in 1930 at the end of September when the total was 24,928,422 pounds. In the first three months of 1931 production continued to exceed shipments and stocks amounted to 28,687,087 pounds. This figure by itself was not alarming for a study of production, shipments and stocks on hand figures for the past ten years reveals many instances when stocks at the end of the month were reported as being much larger. For example, for the first three months of 1922 stocks were over 57 million; in March and April of 1924 they were over 30 million pounds. The same set of figures show, however, that shipments seldom went below 10 million pounds a month while the average for 1930 was slightly over five million a month and for 1931 less than 4½ million pounds a month.

For the past nine months producers of lime have made a very determined effort to bring production more nearly in line with actual needs at the present time and in each month from April to December shipments have exceeded production often by a very wide margin so that at the end of December stocks were down to 8,733,949 pounds or less than two months supply taking the average for the year, but nearer three months supply based on the average shipments for the last three months of 1931.

How drastic this curtailment has been can easily be appreciated by a glance at production figures for these nine months. In July and August the figures dropped considerably below a million pounds while the average for October, November and December is less than two million pounds.

Calcium Acetate Statistics

Year and Month	*Acetate of Lime (in pounds)*		
1930	*Production*	*Shipments*	*Stocks, end of month*
January	9,200,412	2,905,559	11,483,936
February	7,349,140	3,626,064	15,207,012
March	8,832,625	6,296,684	17,742,953
April	7,858,995	4,762,359	20,839,589
May	6,586,953	5,649,178	21,777,364
June	4,734,776	5,609,488	20,902,652
July	3,455,112	3,061,333	21,296,431
August	3,522,506	2,446,939	22,371,998
September	5,895,782	3 339,358	24,928,422
October	5,871,269	7,922,056	22,877,635
November	6,534,761	9,127,638	20,284,758
December	7,357,079	8,375,451	19,266,386
Total Year	77,199,410	63,122,107	....
1931	8,023,412	5,194,666	22,095,132
January	7,073,296	3,467,674	25,700,754
February	7,451,581	4,465,248	28,687,087
March	4,400,047	5,160,348	27,926,786
April	2,952,982	4,673,898	26,205,870
May	1,853,057	3,855,983	24,202,944
June	840,064	4,654,342	20,388,666
July	665,916	4,777,154	16,277,428
August	1,482,131	6,268,212	11,491,347
September	1,528,792	2,172,334	10,847,905
October	2,226,255	3,034,591	10,039,469
November	2,160,688	3,466,208	8,733,949
December*			
Total Year	40,658,221	51,190,658	....

*Preliminary.

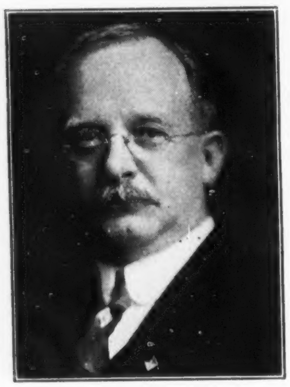
Acetic acid prices have responded to the increase in lime. Commercial 28% acid was raised by producers from $2.50, spot, to $2.75 per hundred pounds: 56%

from $4.60 to $5.10. Glacial acetic in tank cars is now quoted spot at $8.89.

Translated into dollars and cents the March advance in acetate of lime is relatively small. Assuming that 1932 shipments equal those of a year previous the total is a little over $25,000. That it may be a straw pointing to price stability adds weight to its importance. There can be little doubt that after twenty-nine months of progressively poorer business that manufacturers have reduced production schedules radically and are depending upon stocks largely to fill orders. Chemical employment figures would seem to bear out this contention. When stocks again reach low levels producers will think of stepping up schedules and higher prices. Apparently acetate of lime producers feel that they have reached that point.

Association News

Association interest centered in New Orleans as the month closed as over 1,000 of the country's leading chemists and chemical engineers gathered for the 83rd meeting of the A. C. S. In the Metropolitan district the 7th Annual Dinner of the Drug and Chemical Section of the N. Y. Board of Trade (rotogravure section) broke all former attendance records on March 15 when over 700 executives of the chemical and allied industries gathered at the Commodore.



Dr. Charles L. Parsons Awarded the Priestley Medal

Tung oil production, which revolutionized the manufacture of varnishes twenty-five years ago, may become a Gulf Coast region industry, ranking with sugar cane, cotton and corn, it was announced at the opening session of the A. C. S. meeting.

Another feature was the announcement by Dr. Irving Langmuir that gasses and vapors, instead of penetrating into the interior of a solid as water is often absorbed, may be taken up only by the surface of the solid, very much as peas would, if thrown into a tray, form only a single layer.

The Priestley Medal, the highest honor of the Society, was awarded at the opening session to Dr. Charles L. Parsons, secretary of the society, "for distinguished service to chemistry."

Dr. L. V. Redman, president, told the members in his opening address that a careful canvass of the more than 19,000 members of the society had revealed that only 275 chemists of standing are in the ranks of the nation's unemployed.

Developments in Domestic Tung Oil

Dr. Henry A. Gardner, president of the H. A. Gardner Laboratory, Inc., of Washington, delivered an illustrated address on the progress of tung oil production since the first seeds of the tung trees were brought to the United States in 1905 by David Fairchild, plant explorer of the Department of Agriculture, from the Yangtse Valley in China.

"Experiments with the growing of tung trees," said Dr. Gardner, "have shown that there is a very definite region in which they will develop properly here. This zone extends from the southern border of Georgia to the south central part of Florida and westward along the Gulf coast of Florida, Alabama, Mississippi and Louisiana. These experiments seem to promise the South a solution for what to do with its cut-over lands.

The Chinese adulterated tung oil with soy-bean oil, which could be extracted easily, until it became apparent that no two Chinese used the same percentage of adulteration, which complicated the purification problem badly and led to the experiments with the seeds here below the line of more than occasional frost.

"Tung oil is used principally in the manufacture of varnishes and varnish paints. It is also used in making insulating compounds, as an ingredient in automobile brake linings, in gaskets for steam pipes, in linoleum and table oilcloth, for water-proofing fabrics, paper and cartridges, as a binder for wall board and plastic synthetic lumber or lacquers, primers, synthetic resins, battery jar compounds and airplane tubing fillers.

"Tung oil is an important ingredient in quick-drying varnishes, and the demand for it will necessarily grow. The value of the importation of tung oil annually from China has averaged about $12,000,000. About 20,000 acres so far have been successfully planted here to tung oil trees and it is probable that between 50,000 and 100,000 acres, with about 100 trees to an acre, would be necessary to supply the quantity that has been imported from China."

In stating that the society's canvass revealed only 275 unemployed members out of a total membership of more than 19,000, Dr. Redman added that the inquiries showed that the society's chemists have been the last to be dropped from their positions and the first to be taken on to fill new vacancies.

"Industries in general," he said, "have retained their research forces preparing for a continuation of American prosperity which none of them seem to doubt will occur."

Scientific advances in the process of oil refining, conserving America's important petroleum resources, was outlined in a symposium on "Chemical Engineering Processes in the Oil Industry." Dr. R. T. Haslam of New York, vice-president, Standard Oil Development presided.

Latest achievements in the oil industry, forecasting the possible rise of new enterprises, were revealed in technical reports dealing with methods of adjusting oils and fuels to climatic conditions, stabilization of gasoline, and the further improvement and utilization of petroleum products and by-products.

The Society of Chemical Industry, American Section has formed a food group among the members of the society. For the present, at least, there is no additional subscription beyond the usual dues for membership in the society. Further information will be furnished on request to Foster D. Snell, Honorary Secretary of the American Section, 130 Clinton St., Brooklyn, N. Y.

The annual meeting and election of officers and directors of the Oil Trades Association of N. Y. was held March 8 at the Waldorf-Astoria.

The following were elected for the ensuing year: President, Clifford T. Weihman, Smith-Weihman Co.; vice-president, William S. Williams, Asiatic Petroleum Corp.; secretary, Joseph C. Smith, Smith-Weihman Co.; treasurer, Philip C. Meon, Borne-Scrymser; chairman of the entertainment committee, Albert J. Squier, Warren Lubricant Co.; other directors, George Suraud, Chelsea Oil & Supply Co.; Edwin Stern, Louis Stern Sons, Inc.; W. H. Correa, Standard Oil of N. Y.; J. W. Saybolt, Standard of N. J.; H. Mart Smith, W. R. Grace; John W. Baker, Philippine Refining Co. of N. Y.; E. C. Biglow, Sun Oil; D. T. Bloodgood, United Africa Co.

Division of Leather and Gelatin Chemistry of the A. C. S. have accepted the invitation of the American Leather Chemists Association to attend and take part in the annual meeting, which is to be held at the Hotel Traymore, Atlantic City, N. J. May 25, 26 and 27, 1932.

Manchurian Reprecussions in the Oil Markets

Chinese coolies planting soya beans in Manchuria. With the influx of Japanese capital the antiquated practices employed for centuries are rapidly being replaced by more scientific methods

JAPANESE operations in Manchuria, divorced from the jargon of diplomatic exchange, involve land and raw materials, and the most important of these is the soybean, for to the Orient the soybean is of as great, if not greater importance, than the corn crop is to us. To the people of the Far East, this bean is a balanced diet of supreme value. It is a means of replenishing their worn-out soil with nitrogen. It is a big item in Oriental international trade and food for live-stock. Japan, despite intensive cultivation has been unable to produce anything like her requirements. In 1929 she imported over $30,000,000 dollars worth of soybeans from Manchuria and nearly $37,000,000 worth of the bean cake. She has invested over $12,000,000 in milling operations alone and in addition has for several years owned and controlled railroads and port facilities largely with the purpose of dominating the soybean industry of Manchuria. There is decidedly a bean in the soup of the Far East and that bean is the soybean.

To the Far East the soybean is essentially a food. Industrial uses are of a secondary consideration. To us contrarywise industrial uses are of greater comparative consideration. We do not eat soybean oil, but use it in varnishes, paints, enamels, lacquers; also in soaps and candles and in the manufacture of certain types of inks. For these it serves as a substitute for linseed oil and often as an adulterant. The edible grade is used in butter substitutes, and to some extent for other foodstuffs.

The chemical and allied industries are interested therefore, in what effect events in Manchuria will have on supplies and prices.

While soybean cultivation has been practiced in the United States for more than a hundred years, first started in Pennsylvania, only the past decade—more specially the past five years—has the farmer turned in a serious way to the soybean as a major crop. In 1927, only five years ago the total tonnage was 3,087,670 pounds: four years later it had jumped to 14,387,460 pounds. On the other hand imports of soybean oil dropped in the same period from 14,914,792 pounds to 8,348,352 pounds. Evidently we are making rapid strides towards independence of foreign sources of supply. In 1930 the total threshed soybean crop amounted to approximately 13,000,000 bushels and it is estimated that about thirty per cent or somewhat over 4,000,000 bushels were consumed in the manufacture of oil which found its way into industrial uses. Statistics for 1929 as released by the Bureau of the Census shows the consumption of soybean oil to be as follows:

	000 omitted
Total apparent consumption	19,359 lbs.
Lard Compound or substitute industry	82 "
Margarine industry	11 "
Soap industry	6,400 "
Paint and Varnish	5,815 "
Balance miscellaneous uses	7,051 "

An increase in the soybean crop in this country has been handicapped seriously by the problem of disposing of the cake or meal profitably. The oil comprises only about one-seventh of the total weight, the remainder being meal and this product has been amply proved in Asia and in Europe, and to some extent in this country a splendidly concentrated food suitable for all kinds of animals. Yet for one reason or another the use of the meal for this purpose has not kept pace with the crop with the result that meal stocks constantly carry over. In 1930 approximately 100,000 tons of meal were produced and while actual consumption figures are difficult to obtain it is known that a large part of this tonnage is still on hand. In foreign countries, the use of soybean meal cake as a cattle and poultry feed has developed rapidly. In Denmark, for example, with a population of approximately 2,000,000 over 138,000 tons of soybean oil meal were consumed in 1930. The problem is largely an educational one and upon its solution depends the growth of our soybean acreage. Possible expansion in the use of soybean meal as an ingredient of mixed fertilizer is principally one of economics.

Soybean oil is considered the most interchangeable of all fats and is often referred to as a "three way oil." The price, and hence the use, of soybean oil is subject to the prevailing prices for cottonseed, linseed, palm oil, and palm-kernel oils. The chemist has perfected the technique of substitution of one for the other specially in the soap industry. With an iodine number of 137-143 and a saponification number of 193 soybean oil stands about midway in physical and chemical characteristics in the list of common oils and fats, and the consumption of soybean oil in the soap industry illustrates quite clearly its interchangeability.

The tariff history of soybean oil in recent years is of special importance due to the size of our imports from Manchuria. Previous to 1921 soybean oil was on the free list. In the emergency act of 1921 a duty of 20 cents a gallon was imposed. The tariff act of 1922 lowered this duty to 2½ cents a pound or 18¾ cents per gallon. In the preliminary hearings of 1929 and 1930 for the Smoot-Hawley Tariff the domestic producers generally requested an increase and the result was an increase from 2½ cents to 3½ cents. From the consumption figures of soybean oil in soap making it would appear that when low prices prevail that large quantities are consumed and when prices rise above the corresponding values for cocoanut, palm kernel, palm and whale oil that an appreciable decline occurs.

Year	*Used in soap kettle*	*Total*
1912	1,182,000	28,020,000
1914	4,499,000	16,364,000
1916	57,373,000	98,171,000
1917	124,058,000	162,734,000
1919	58,401,000	195,808,000
1921	10,756,000	16,711,000
1922	2,307,000	13,634,000
1923	3,266,000	33,222,000
1924	2,500,000	11,210,000
1925	2,500,000	15,905,000
1926	2,500,000	26,370,000
1927	2,500,000	14,915,000
1928	2,500,000	10,863,000

Spokesmen for the domestic industry pointed out at the hearings that it is possible to treble the production of the soybean crop in Manchuria and pleaded that a restoration to the free list would result in a greatly increased Manchurian acreage and that consumers of the oil in this country would employ soybean as a lever to force competing fats and oils to lower prices. It is quite possible that with Japan in control in Manchuria that greater attention and larger capital will be devoted to further development of the soybean industry, and the question of how much protection is beneficial to domestic producers is one of very delicate balance. Too high a price will drive consumers to competing products with a corresponding drop in consumption. At just what point the domestic producers receive the maximum benefit, price and consumption both considered, is indeed a difficult question.

The soap industry has maintained that the degree of interchangeability of fats and oils is now limited within certain boundaries. Twenty years ago a large part of this total production was of yellow-soap while today most white-soap predominates; that peanut or cottonseed oil cannot replace cocoanut oil or palm-kernel oil except in a national emergency when reversion to the less desirable yellow grades would be unavoidable. The whole problem is most complicated with the supposedly correct answers depending upon the source.

The Tariff Commission has recently submitted a report to Congress giving a detailed study of the costs of production and of transportation to the principal consuming markets of the United States of

(SOYBEAN STATISTICS 1927-1930)

Year	*Production of Oil*		*Consumption of Oil*		*Stocks on Hand Dec. 31*		*Raw Materials Employed tons*	*Raw Material in stock Dec. 31 tons*	*Oil seeds Imported lbs.*	*Imports of Oils*	*Exports of Foreign Material*	*Exports of Domestic Material*
	Crude	*Refined*	*Crude*	*Refined*	*Crude*	*Refined*						
1930	14,387,460	6,629,215	14,599,109	8,929,563	12,283,984	2,720,440	51,937	33,401	3,851,796	8,348,352	517,009	4,962,422
1929	11,008,743	7,831,283	20,793,293	4,940,660	12,577,179	2,870,772	40,537	14,403	4,337,160	19,489,129	29,096	7,967,396
1928	4,715,908	7,440,573	15,456,976	3,997,439	4,574,010	1,409,495	18,102	1,392	4,255,734	13,116,220	852,307	7,142,097
1927	3,087,670	5,681,408	11,366,116	3,540,340	4,704,220	1,491,824	11,864	908	4,189,168	14,914,792	1,184,343	5,444,305

several of the important oils used commercially in large quantities. Two major sections of the report deal with facts bearing on the question of replacement. One of these relates to the interchangeability of the several kinds of oils and fats in different uses from the technical standpoint—that is, from the standpoint of the chemical and physical characteristics of the several oils and of the products derived from them. The second analysis covers the economic factors involved, such as relative costs, prices, supply and demand. The report includes a discussion of the degree to which imported oils might be replaced by a reduction of the exports of domestic oils and fats, including lard, and a discussion of the quantitative limitations surrounding the potential increase in production of domestic oils and fats to replace imports.

Summary of Consumption Figures

The Senate resolution named six imported vegetable oils together with copra, and whale oil. The total consumption of the oils named, including the coconut oil derived from imported copra, in the United States during 1929 was more than one billion pounds, the most important items being coconut oil, 662 million pounds; palm oil, 231 million pounds; and palm-kernel oil, 84 million pounds. The investigation covers not merely these specified foreign oils but also others of less importance, as well as the domestic oils and fats with which the foreign products compete. There is a discussion of the relation of imported oils to butter, the consumption of which is more than two billion pounds, and to lard, of which about one and three-quarter billion pounds are consumed. The other principal domestic oils discussed are cottonseed oil, with consumption in 1929 of about 1,580 million pounds (including foots); oleo oil and related edible animal fats, 124 million pounds; inedible tallow and animal greases, 840 million pounds; corn oil, 138 million pounds; and peanut oil, 17 million pounds. There is also a discussion of the possibility of increased production of soybean, sunflower seed, and other vegetable oils not now produced in this country, or produced only in relatively small quantities.

Domestic vs. Imported Oils

The report takes up separately the position of the various imported and domestic oils in the several manufacturing industries in which they are principally consumed. The largest consumption is in the soap industry, in which during 1929 there were used about 1,500 million pounds of domestic and foreign oils. In the lard compound or lard substitute industry, the consumption was about 1,200 million pounds; in the margarine industry, about 300 million pounds; and in the paint and varnish industry, about 450 million pounds; minor quantities are used in a number of other industries. Besides this industrial use there is an immense direct consumption of several oils and fats in their original form as food, as well as considerable direct consumption of some oils in non-food uses.

The report shows that in the soap industry there and is approximately an equal consumption of domestic of foreign oils, the leading domestic oils or fats used being inedible tallow and greases and cottonseed oil foots, and the leading foreign oils, coconut, palm and palm-kernel. In the lard compound industry most of the oils consumed are of domestic origin, with cottonseed oil predominant. In the margarine industry, much more than half of the consumption of oils consists of coconut oil, but there is also a considerable consumption of domestic oleo oil, neutral lard and cottonseed oil. In the paint and varnish industry the principal oils used are linseed, partly of domestic and partly of foreign origin, and tung oil, which is exclusively an imported product.

New Construction

Davison-Pick Fertilizers, Inc., New Orleans, subsidiary of Davison Chemical, will rebuild fertilizer manufacturing plant at Gretna, La., which was burned with a loss of about $200,000 some weeks ago.

U. S. Potash let contract for constructing potash refining plant. Plant will cost approximately $1,000,000. Buildings are to be of structural steel and concrete. As a part of the machinery equipment there will be two steam turbines, each of 12,000 horsepower. Refinery will be connected with company's potash mines by 12-mile railroad. When the refinery is ready for operation, September 1, production of the mine will be vastly increased.

Eagle-Picher Lead, largest mining factor in the tri-state district, awarded to Tri-state Contractors, Inc., of Tulsa, contract for the steel and concrete work on the new central concentrating plant at Picher. Contract amounts to more than $100,000 for labor and materials. The project will cost more than $500,000 when completed and will be the largest lead and zinc mill in the district with a grinding capacity of 3,600 tons daily.

Jefferson Lake Oil Co., new sulfur company at Lake Peigneur, La., is waiting upon the Southern Pacific to complete a spur to the properties before erecting its plant. Plans call for a modern unit producing 100,000 tons. Contracts for erection of the buildings and the mechanical equipment, in place, have been awarded and the plant is to be completed within 60 working days from delivery of the equipment and materials on the plant site.

Sulfur bearing area outlined by drilling to serve as a basis for calculation for the plant has been extended by recent well completion, Arthur Barba, sr., company president stated. Company operates under direct lease from the State of Louisiana covering the bottom of Lake Peigneur, under which the sulfur bearing caprock has been found and also holds mineral leases on lands adjoining the water.

Camphor, now a very important raw material to the plastics industry and now obtained chiefly from the Orient, may soon be distilled in commercial quantities from the American cedar tree, if experiments which have been made in the chemical laboratories of Southwestern University are carried forward to successful completion.

"Chemiker-Zeitung" for Jan. 2 announces that the Vereinigte Chemische Fabriken at Leopoldschall, Staussfurt, manufacturers of the rare element rhenium, have succeeded, after lengthy experimental trials, in isolating gallium by a method which enables them to produce the metal at one-twentieth of its former cost, which a year ago stood at about 175 gold marks per gram.

Old Chemistry Rejuvenated

By Joseph Kalish

METHANOL, ammonia, nitric acid directly from their elements have long appealed to the sense of simplicity of chemical industrialists, but only after exhaustive engineering studies have they become realities. The "new chemistry" of today is compounded, in equal parts, of a really new high-pressure, high-temperature technique and the old traditional chemistry. It has given industry products and processes which in the past were among the curiosities of the laboratory.

Ethylene and ethyl ether, school exercises in organic laboratory technique, result from the interaction of sulfuric acid and ethyl alcohol. Intermediate ethylsulfuric acid flexibly responds to treatment leading to regeneration of alcohol or liberation of either of the two other products. The chemical economist and the chemical engineer, working with new raw materials, have profitably collaborated in another encroachment of the synthetic on the natural.

Starting from petroleum "cracking" gases, useful only in competition with extremely cheap fuels, the chemist utilizes the unsaturated ethylene content to produce ethylsulfuric acid, reversing his old school experiment. Dilution with water leads to ethyl alcohol and ethyl ether. Costs of the vital reconcentration and recovery of sulfuric acid compel the chemical engineer to devise the last word in equipment for this purpose. Where the manufacturing company is a substantial consumer of alcohol, costs are further pared. With consumption equal to productive capacity, over-all costs need only be somewhat lower than the purchase price. With excess capacity, the product sold earns the difference between cost and selling price as well as the saving to the manufacturing consumer, and at the same time allows more profitable, larger scale production.

Similar interaction of chemical, technical and economic factors hold in the synthetic manufacture of isopropyl alcohol and acetone from the propylene accompanying the ethylene in the raw material gas. Secondary butyl alcohol from the butylene also present competes with the normal compound produced in the special fermentation of corn. Further, isopropyl alcohol encroaches upon fields ordinarily held by ethyl alcohol, while the by-product isopropyl ether has only recently come into its own as a probably valuable solvent in manufacturing acetic acid.

Other investigations will commercialize traditional processes. Ethylene and chlorine lead to ethylene dichloride, "Dutch liquid," which has possibilities as a solvent. But it is ordinarily too stable for much further treatment, although ammonia produces a rubber accelerator, ethylene diamine, and sodium acetate gives glycol diacetate.

Hypochlorous acid, however, replacing chlorine, produces ethylene chlorhydrin, a flexible intermediate, which easily leads to ethylene glycol. The latter is immediately useful as a substitute for glycerine, to which it is closely related physically and chemically. Again collaboration of chemist and economist opens a new outlet, low freezing glycol dinitrate explosive. Not content with these, the investigators look at the inexhaustible needs of lacquer formulators for new solvents. Glycol, an alcohol type, when combined with either an ester or an ether, should prove useful and by ethylating one end of the molecule, this is found to be true. Changing the new radical leads to the whole series of ethylene glycol ethers of different boiling points. In addition to their high solvent power, because of their comparatively faint odors, they have had a favorable reception. Esters of these compounds are also useful in the same application.

Diethylene and triethylene glycols are made by removing the elements of water from ethylene glycol while the theoretically simple treatment of the original chlorhydrin with ammonia yields the now well-known triethanolamine, a very useful organic base.

From the saturated portion of the raw material, hydrogen and methane are cheaper sources of old commercial products. Crack methane to unusually high yields of carbon black and to hydrogen of high purity for the ammonia synthesis. Chlorinate methane to methyl chloride, the refrigerant and organic reagent, or to chloroform and carbon tetrachloride, solvents and a fire extinguisher. Oxidize methane to formaldehyde or methanol. Or use the high quality casinghead gasoline, not as a fuel, but as a chemical raw material for its pentane content. Chlorination and subsequent treatments yield amyl alcohol and its acetates, the knell of fusel oil as a necessity.

All of these processes are conventional, textbook chemistry. But with the modern differences of marketing altogether new materials and meeting costs set by new economic exigency. The result is continued profit in the midst of increased competition.

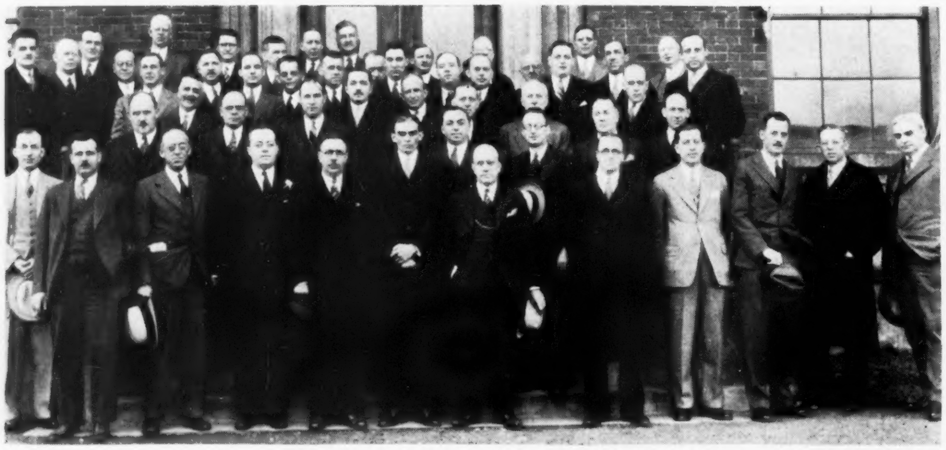
Thus the modern research picture is often of chemical investigators searching the textbooks and literature of organic chemistry and listing the possible products to be obtained from given raw materials. Chemical economists seek the probable uses for these products and fix the prices which will enable these new materials to replace or supplement old ones. Engineers translate these results into a plant operating at lowest cost. The consumer benefits in brighter, more durable automobile finishes, cheaper cosmetics, better radio parts, stronger tires, etc. etc.

CHEMICAL N

Photographic Record of

Wide World

Winner of the William H. Nichols Medal: Professor James B. Conant of Harvard U. receives award given by the N. Y. Section of the American Chemical Society from Dr. Arthur E. Hill (right) of New York University



The first joint sales convention of Calco Chemical and its associated company Heller & Merz held recently at the Calco main office at Bound Brook, N. J. Approximately 50 representatives from all the branch offices attended. The first day was devoted to meetings addressed by R. C. Jeffcott, president, Calco; F. M. Fargo, Jr. and August Merz, vice presidents; W. J. Robertson, vice president of Heller & Merz; J. H. McMurray, Dr. V. L. King, R. M. Taylor, J. W. Boyer, N. B. Conley and O. A. Badenhausen. W. B. Bell, president, American Cyanamid, parent company of Calco, and Dr. M. C. Whitaker were guests of honor at a dinner held at the Plainfield Country Club, after which Mr. Bell briefly reviewed the history and growth of American Cyanamid and also outlined various important developments now under way

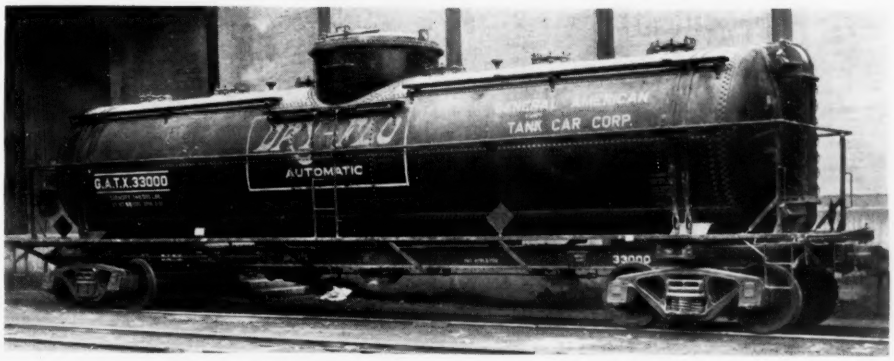
The 7th annual dinner, Drug, Chemical, and Allied Trades section, N. Y. Board of Trade, held March 15 in the Commodore, brought together 700 men executives. Percy C. Magnus, chairman of the section, presided at the speakers' table. R. D. Keim, E. R. Squibb, was toastmaster. Speakers were Gilbert T. Hodges, president, Advertising Federation of America and a member of the executive board of the New York Sun; Lowell Thomas and Julius Tannen, humorist.

Arrangements for the dinner were made by the executive committee of the section under the direction of S. W. Fraser, of Burroughs, Wellcome, and by the entertainment committee, of which B. J. Gogarty, of Rossville Commercial Alcohol, was chairman.

NEWS REEL

of Chemical Activities

Hercules completes erection of new addition to Hercules, California plant. View from top of ammonia storage looking toward oxidation house



A startling innovation in the transportation of granular materials introduced by the Special Car Development Department of the General American Tank Car Corp. Tank cars will now be employed to handle chemicals which formerly moved in bulk, bags or barrels. Cars are loaded through six openings at the top and unloaded through a single bottom outlet. Car is divided into two compartments with drag chain, operated by motor, keeping materials moving toward the outlet

Said Mr. Hodges, "the 'cheer leaders' in the lush year of 1929 have been the 'fear leaders' during the depression; they were wrong in 1929 and they are wrong now."

Business men who wish to survive the depression must get to work; they must stop riding in the wagon and get out and push. That is what the alert and smart executive has been doing in the past two years. This is an era when many men are going to make a lot of money, when many companies will make new records in business and profits. It was done in 1930 and 1931; it is being done now in 1932, he averred.

"Obsolescence will be one of the greatest factors in the stimulation of business this year; shabby, worn-out, or out-of-date articles cannot last much longer. The forty million people still at work will soon have to replace worn-out merchandise and factories will soon have to speed up to supply the goods"

The Preparation of Emulsions*

By William Clayton, D.Sc., F.I.C.

When two pure immiscible liquids are shaken together or otherwise violently agitated, a temporary but very unstable emulsion is produced. When agitation ceases, the liquids rapidly separate. Two quite pure liquids cannot form an emulsion, except of great dilution (oil hydrosols), and even so, no emulsion of water drops in a pure organic liquid has been recorded. To prepare a stable concentrated emulsion of oil-in-water or water-in-oil, it is essential to have present a third substance capable of functioning as an emulsifying agent. According to the newer ideas the mechanism of this emulsifying action is intimately linked up with surface films, molecular orientation, and interfacial tension.

Emulsifying agents fall into two classes, those capable of stabilizing emulsions of oil-in-water, and those which stabilize emulsions of water-in-oil. Again, for either type of emulsion, emulsifying agents are known which are present as insoluble finely-divided solids, or in true solutions. In most cases the emulsifying agent surrounds the dispersed globules of oil, or water, forming an adsorbed film or layer, the effect of which is an enhanced stability of the system.

The pioneer investigators in this field were Ramsden (*Proc. Roy. Soc.*, 1903, *72*, 156; *Zeits. phys. Chem.*, 1904, *47*, 336.) and Donnan (*Koll. Zeits.*, 1910, *7*, 208), working along entirely different lines. Ramsden's work began with the frothing of solutions, a phenomenon well known in colloid systems. Froth or foam represents an enormous film-like area of liquid supported in a gas, usually air. Since the interface is now very great, adsorption is pronounced, and Ramsden observed that in certain cases the adsorbed colloid in a frothing solution became so concentrated in the froth as to be "precipitated" in solid or semi-solid lamellae or membranes. Particularly striking were his experiments with aqueous solutions of albumin, which, on agitation or pouring from one vessel to another, gave a most persistent foam stabilized by solid albumin, irreversibly precipitated from solution.

Donnan arrived at conclusions similar to those of Ramsden by his investigations relating to the interfacial tension between oils and soap solutions. Using the now familiar drop-pipette, Donnan determined the number of drops of oil rising through a solution of caustic soda under standard conditions. The number of drops is, as a first approximation, inversely proportional to the ease or degree of emulsification of the oil in the alkaline solution. Colza oil in pure water had a drop number of 88, whilst in N/1000 NaOH, the drop number rose to 306. With 1.3N/1000 NaOH the drop number was indeterminate, the oil simply streaming through the aqueous phase. Donnan next showed that a pure oil, freed from fatty acid, had exactly the same drop number in water and N/1000 NaOH. Thus, it was apparent that the formation of soap caused the increasing dispersion of the oil in water.

So far no indication has been given of what determines emulsion type. Experience has empirically divided emulsifying agents into two classes: (a) those promoting the O/W type, and (b) those promoting the W/O type. Emulsions of oil-in-water are stabilized by colloids such as gelatin, albumin, lecethin, agar, gum acacia and gum tragacanth, Irish moss and sodium and potassium soaps. Such powders as silica, colloidal clay, kieselguhr and freshly precipitated calcium carbonate, calcium arsenate and basic cadmium sulfate are also effective. Emulsions of water-in-oil are stabilized by gum dammar, cholesterol, calcium, magnesium, nickel and zinc soaps, crude rubber, resin and lanolin. Solids as carbon, soot, asphalt and mercuric iodide also serve. As an empirical rule, Bancroft (J. *Phys. Chem.*, 1914, *17*, 515.) pointed out that emulsions of oil-in-water are stabilized by substances giving colloidal solutions in water, and that substances giving colloidal solutions in oil stabilize water-in-oil emulsions.

There is no geometrical limit to concentration to the amount of liquid which can be dispersed in another liquid using a suitable emulsifying agent. Assuming the dispersed liquid consisted of equal sized globules as spheres, it would follow that the maximum amount capable of being dispersed would be about 74 per cent., at which concentration any given globule would

*Abstracted from paper delivered before the Engineering Group, Society of Chemical Industry

be surrounded by, and in contact with, twelve other globules. Since, however, the liquid globules are deformable and since the film of emulsifying agent assists such deformation, more and more liquid can be dispersed, the globules squashing together. Again, the majority of emulsions contain globules of very varied size, so that small globules can be squeezed into the spaces between the larger ones.

Emulsions of 99 per cent. of oil in water have been prepared by Pickering, and emulsions of 90 per cent. of water in benzene were made by Newman (*J. Phys. Chem.*, 1914, *18*, 45.) using 1 per cent. magnesium oleate as the dispersing agent. Emulsions containing over 80 per cent. of dispersed liquid are extremely viscous; in fact, Pickering's emulsions could be cut into cubes.

Emulsification Defined

Emulsification is the art or practice of dispersing a given liquid as more or less permanent globules in another liquid medium, and numerous machines have been devised to secure an intimate subdivision of the disperse phase in the continuous medium. The general principle involved is agitation of the two liquids in vessels which are usually jacketed to permit of temperature regulation by circulating steam, or hot or cold water as desired. The emulsions are usually prepared in batches, although continuous-flow emulsifying apparatus are also in use.

The ideal method of preparing emulsions is that wherein the internal phase is projected in a finely-divided condition inside the main bulk of the external phase out of contact with a gas phase. The whole work of dispersion can thus be made on the internal phase and adsorption at the dineric interface can be reached without the interfering adsorption at the gas-liquid boundary common to the usual agitation of stirring methods. Conversely mixing liquids by means of blowing gas through them, is a faulty and unscientific method, since adsorption is pronounced in the resulting froth and not in the liquid-liquid interface. Indeed, good emulsions may actually be "broken" by agitation alone, the protective colloid or emulsifying agent leaving the oil-water interface by preferential adsorption at the air-water interface.

It is reasonable to believe that for any emulsifying apparatus or machine there exists an optimum speed or degree of agitation or mixing, and an optimum time of running, whereby the most stable emulsion can be attained for a given system. Experiments prove this to be correct. Bechold, Dede and Reiner (*Koll. Zeits.*, 1921, *28*, 7) found that the formation of emulsions of water and organic liquids, using finely-divided solids, reached an optimum after ten minutes standard shaking. Herschel (U. S. Bureau of Standards, *Technological Papers* No. *86*) has investigated the effect of duration of stirring and speed of agitation, when emulsifying lubricating oils in water. He adopted five minutes as the time for agitation, using an electrically-driven paddle, in all his tests, having found that no marked increase in stability of the emulsions followed longer agitation. He also found that, in general, there is a speed above which the stability of the emulsions decreased. The curve representing the relation between speed and stability passes through a minimum, so he adopted a speed of 1,500 r.p.m. since, on the average, it gave a minimum rate of separation. Under constant conditions of agitation, the graph connecting time with emulsification effected is of the exponential type. The practical significance of such results is obvious, inasmuch as excessive expenditure of power in making emulsions is unnecessary, an optimum working time being readily ascertained.

Interesting work on emulsification has also been carried out by Briggs (*J. Phys. Chem.*, 1920, *24*, 120.) who, thinking that the mode of shaking a mixture of benzene and sodium oleate might be an important factor, found that intermittent shaking was much more effective than the usual uninterrupted shaking. Briggs concluded that "intermittent shaking may be six hundred or even a thousand times more effective than uninterrupted but equally violent agitation." Shaking by hand, mixtures of benzene in 1 per cent. aqueous sodium oleate, Briggs found that to emulsify 60 per cent. by volume of benzene 750 shakes were necessary, occupying 4.2 minutes. The same mixture could be completely emulsified with 5 shakes in less than 1 minute, if after 2 shakes a rest of 30 seconds was permitted. It was observed that the time required to form a complete emulsion with intermittent agitation passes through a minimum as the rest interval increases. It would appear, therefore, that the ideal process of emulsification is one wherein the dispersed phase is as completely disintegrated as possible, whilst the continuous medium is left as far as possible unbroken.

Effects of a Rise in Temperature

The effect of rise in temperature is, in general, to make emulsification easier. Reduction of viscosity is obviously a factor concerned. The main interest, however, lies in the relation of temperature to the interfacial tension and the adsorption of the emulsifier at the interface. For non-miscible liquids rise in temperature is usually accompanied by a decrease in the interfacial tension, a condition favorable to emulsification. With an emulsifying agent soluble in one liquid, change of solubility with temperature may introduce complications.

The ultimate stability of an emulsion depends on several factors. Enhancing stability will be (1) fine dispersion of the globules, (2) a minimum difference in the densities of the two phases, (3) a viscose continuous phase, and (4) a stable film around the globules. For the last factor, time may be necessary

to permit adequate adsorption of the emulsifying agent, accompanied in some cases by de-solution due to denaturation. We are therefore led to the conclusion that a given emulsifying agent plays two parts: (1) it permits easy dispersion owing to a reduced interfacial tension, and (2) it may promote stability after its adsorption, assuming the absence of disturbing factors such as chemical change or such physico-chemical alteration as leads to syneresis. Reduction of interfacial tension should also render emulsification easier.

The actual mechanism of emulsification is extraordinarily complex. The emulsifying agent serves to inhibit the coalescence of the internal phase and does not necessarily determine the degree of dispersion reached.

In dairy technology and in the preparation of salad cream the homogenizer is the favourite machine for fine dispersion of an already prepared emulsion. By means of three or six pistons working successively by the aid of shaft eccentrics, the emulsion is forced under great pressure through an homogenizing valve which usually takes the form of two ground surfaces seating accurately as a drop and lift valve. Well-known types of such apparatus are the Jensen-Andersen, Gardner, de Laval, Manton-Gaulin, and Viscolizer. The emulsion is forced into the homogenizer at a pressure up to 5,000 lbs. per sq. in. and the valve through which it must pass is gauged with a strong spring which allows a valve clearance of only a few thousandths of an inch. The seating and unseating of the valve takes place with greater frequency, the emulsion passing through the opening with a velocity up to 25,000 ft. per sec.

Homogenization produces a great increase in the viscosity of an emulsion, due to the enhanced adsorption of emulsifying agent at the newly-formed extensive oil-water interface. It is significant that the second stage homogenization greatly reduces this viscosity. No adequate explanation has yet been proposed to account for the phenomenon of globule clusters. Investigations should be carried out with a given oil and water, using quite different kinds of emulsifying agents such as solid powders, gums, and proteins, so that variations in the nature of the adsorbed layer may be explored in relation to the incidence and magnitude of clustering.

Pullman Co., is busy installing air conditioning equipment on several cars. Refrigerating agent used is a gas called F-12 or Freon produced by Kinetic Chemical, a du Pont subsidiary. Gas is a fluoride which is non-poisonous, non-explosive and non-inflammable and can be used indefinitely.

Experiments conducted by the Georgia Experiment Station show that the use of dolomitic limestone in cotton fertilizers containing sulfate of ammonia is a very profitable investment for farmers in the Piedmont section of the state. In these experiments increases of 100 to 200 pounds of seed cotton are often obtained from small amounts of limestone where the fertilizers contain sulfate of ammonia.

Bauxite Figures for 1931

Shipments of bauxite from mines in the U. S. in 1931 were 195,895 long tons, valued at $1,140,629, a decrease of 41 per cent in both quantity and total value, as compared with 1930, according to the U. S. Bureau of Mines.

Bauxite shipped from mines in the United States, 1927-1931

	Alabama, Georgia,[1] and Tennessee		Arkansas		Total	
Year	Long tons	Value[2]	Long tons	Value[2]	Long tons	Value[2]
1927.....	17,110	$95,920	303,830	$1,892,860	320,940	$1,988,780
1928.....	14,190	80,668	361,236	2,193,230	375,426	2,273,898
1929.....	14,723	84,480	351,054	2,181,158	365,777	2,265,638
1930.....	15,339	104,908	315,273	1,823,389	330,612	1,928,297
1931.....	9,198	59,179	186,697	1,081,450	195,895	1,140,629

[1]No production from Tennessee in 1927, 1929, 1930, and 1931. [2]Value f. o. b. mines.

In Alabama bauxite was produced in 1931 from the Eufaula and "Lennig" mines, in Barbour County. The shipments (all for use in the chemical industry) were 53 per cent less than in 1930.

Bauxite was produced in Georgia in 1931 at the Hatton and "Easterlin" mines, in Sumter County. Shipments from Georgia in 1931 (all for use in the chemical industry) were 27 per cent less than in 1930.

In 1931 bauxite was produced in Arkansas at four mines—the England and Dixie No. 2, in Pulaski County, and the Bauxite and Superior mines, in Saline County. Shipments of bauxite from Arkansas in 1931 were 186,697 long tons, a decrease of 41 per cent from 1930. The main production originated in the Saline County field, in which there was a decrease of 42 per cent. The mines in Pulaski County shipped 35 per cent less bauxite in 1931 than in 1930. The shipments from Arkansas were mainly for use in the aluminum industry, followed in order by the abrasives, chemical, and refractories industries.

Domestic Bauxite Shipped by Producers to Industries in the U. S.

Long tons

Year	Aluminum	Chemical	Abrasive	Cement and refractory	Total
1927.....	186,490	62,410	71,790	250	320,940
1928.....	218,398	83,992	72,931	105	375,426
1929.....	172,807	86,419	99,925	6,626	365,777
1930.....	179,869	67,690	82,116	937	330,612
1931.....	83,340	58,424	53,631	500	195,895

Supply of Bauxite in the United States

	Domestic shipments		Imports		Total new supply	
Year	Long tons	Value	Long tons	Value	Long tons	Value
1927.....	320,940	$1,988,780	356,580	$1,572,236	677,520	$3,561,016
1928.....	375,426	2,273,898	350,111	1,534,498	725,537	3,808,396
1929.....	365,777	2,265,638	380,812	1,753,840	746,589	4,019,478
1930.....	330,612	1,928,297	409,678	1,995,941	740,290	3,924,238
1931.....	195,895	1,140,629	306,490	1,495,577	502,385	2,636,206

Bauxite (Including Bauxite Concentrates) Exported

Year	Long tons	Value
1927..	121,858	$7,800,491
1928..	112,984	5,210,912
1929..	133,551	3,926,283
1930..	104,504	3,776,774
1931..	88,370	3,309,208

The producers of domestic bauxite reported sales during 1931 at prices ranging from $4.90 to $12.60 a long ton. The average for Arkansas bauxite was $5.79 a ton, for Alabama and Georgia $6.43, and for the U. S. $5.82. The quoted prices for bauxite were as follows: Domestic: Chemical ore, crushed and dried, 55 to 58 per cent Al_2O_3 and 1.5 and 2.5 per cent Fe_2O_3, $6.50 to $8.25 a long ton f. o. b. Alabama and Arkansas mines; foreign: Dalmatian bauxite, 50 to 55 per cent Al_2O_3 and 1 to 3 per cent SiO_2, $4.50 to $6.55, Istrian, 54 to 57 per cent Al_2O_3 and 3 to 5 per cent SiO_2, $5.50 to $7, and French, 56 to 59 per cent Al_2O_3 and 2 to 4 per cent SiO_2, $6 to $8 a metric ton c.i.f. Atlantic ports.

[1] Metal and Mineral Markets,, Vol. 2, 1931.

The Portland Cement Association is conducting over 40,000 different chemical and physical tests and experiments a year to improve the quality and multiply the uses of cement. Chemicals are used in determining composition and quality of specific road materials, with a view to determining their suitability and adaptability to particular projects.

The Cellulose Ethers

A Detailed Survey of the Patent Literature

By Charles E. Mullin, Ph. D.
and
Howard L. Hunter, Ph. D.

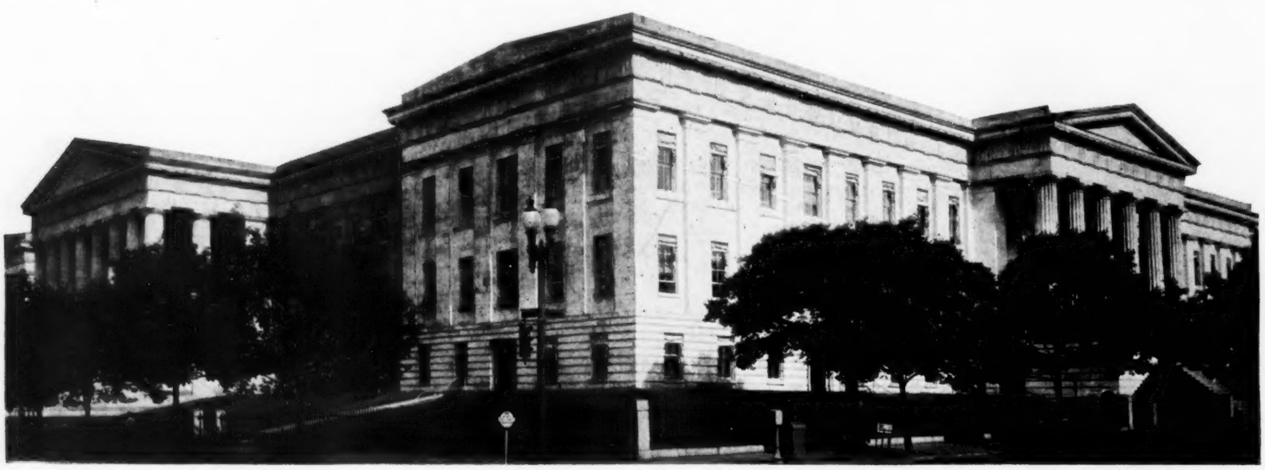
IN THE original Bayer patent, only the ethyl ethers of cellulose are mentioned. The fundamental published research on the methyl ethers is that of Denham and Woodhouse(1), which has just been discussed. In their later work(3) these investigators prepared methyl cellulose from cotton wool impregnated with a solution of 17 per cent. sodium hydroxide by adding dimethyl sulfate until the reaction mixture was no longer alkaline. After washing and repeating the methylation process four times, the product was soaked, in the absence of air, in a 38 per cent sodium hydroxide solution, and again treated with dimethyl sulfate. This treatment gives a product having a methoxyl (OCH_3) content of only 23.9 to 26 per cent, which is considerably less than that required for trimethyl cellulose.

Success finally crowned the efforts of Denham(5) and by increased methylation with dimethyl sulfate, he prepared a product which closely approached the theoretical composition of trimethylcellulose, with a methoxyl content of 44.6 per cent.

Urban(10) methylated lignin at ordinary temperatures and observed that the methoxyl content rose rapidly from 15 to about 24 per cent; further treatment yielded a product containing 32 per cent of methoxyl. Cellulose, methylated under the same conditions, gave a product containing 44.5 per cent of methoxyl, corresponding very closely to the product obtained by Denham. Fir wood was methylated by Urban to 40.9 per cent.

Hess and Pichlmayr(9) prepared crystalline trimethyl cellulose and determined various constants of this substance as well as its molecular weight. These results will be discussed at greater length later. Freudenberg and Braun(13) state that the products obtained by these various investigators have different solubilities and, therefore, must be different substances. Hess, Trogue and Frieser(15) believe that the difference in properties is due to the preservation of the non-cellulosic coating of the fiber in some instances, which accounts for the difference in the solubility of the resulting ether. Undoubtedly all of the above are more or less right, but the variations in the raw materials and in the details of the methods used are quite sufficient to cause a considerable difference in the properties of the resulting ethers.

Berl and Schuppr(18), using the method of Denham and Woodhouse, conducted twenty-eight successive methylations of cellulose and obtained the mono-, di-, and tri-methyl derivatives after one, five, and twenty-five methylations, respectively. These products contained 17.39, 33.23, and 43.91 per cent of methoxyl, respectively. Methylation of alkali-soluble cellulose, regenerated from 75 per cent sulfuric acid solution



The Patents Building at Washington, D. C. In the near future this department will move into the new Commerce Building.

instead of cotton linters, yielded products containing 19.17 to 30.71 per cent of methoxyl, depending on the various conditions of temperature, concentration, and time. All of the above-mentioned investigators seem agreed that a temperature of 20°C. is suitable for methylation with methyl sulfate.

Properties of Methyl Cellulose

The properties of methyl cellulose vary between wide limits with the degree of methylation. The original cellulose methyl ethers of Denham and Woodhouse[1] were only partially methylated. These white, amorphous substances, with the formula $C_{12}H_{19}O_9$-OCH_3, are soluble in cuprammonium solution. The $C_6H_9O_4OCH$ product will form an xanthate. The monomethyl cellulose prepared by Berl and Schupp[18] is soluble in water and insoluble in alcohol, but the dimethyl derivative is insoluble in water and soluble in alcohol.

Denham's later product[5] is nearly pure trimethyl cellulose and retains the fibrous structure of the original cellulose. It is insoluble in Schweizer's reagent, and nearly insoluble in alcohol and acetone. Denham also found that the less highly methylated celluloses are more soluble in Schweizer's reagent. Urbanr[10] states that trimethyl cellulose dissolves in chloroform to form a clear and highly viscous solution. Freudenberg and Braun[13] substantiate this statement and state that the same condition holds for the solubility of this product in ethylene chloride and acetic acid. The solubility of the methyl ethers in mixed solvents and complex organic solvents will be discussed later.

[l] French Patent No. 684,330.
[m] German Patent No. 332,203.
[n] German Patent No. 363,192.
[o] French Patent No. 447,974.
[p] British Patent No. 149,320.

Hess and Pichlmayr[9] were the first to prepare crystalline trimethyl cellulose. They first made an amorphous trimethyl cellulose by Denham's method[5]. This was dissolved, to give a 10 per cent solution, by weight, in a solution consisting of equal parts of ether and alcohol. Concentration of this solution yields white, needle-like crystals of trimethyl cellulose. These are soluble in cold water and are precipitated on heating this aqueous solution. The optical properties of the crystalline trimethyl cellulose were determined, using various liquids as solvents, and the solutions were all found to be levo-rotatory, the specific rotation varying from −4.34° in chloroform to −18.52° in benzene.

The molecular weight of the crystalline compound was determined, using acetic acid as the solvent. At a concentration of 0.1005 per cent, a fairly constant molecular weight of about 200 was found. At higher concentrations the apparent molecular weight increases rapidly, probably due to molecular association, and at a concentration of 0.812 per cent, the apparent molecular weight is around 600.

The first recorded preparation of cellulose ethyl ether is that described in the original Bayer patent, previously discussed, using ethyl chloride as the alkylating agent. Berl and Schupp[18] ethylated alkali-soluble cellulose, regenerated from a 75 per cent sulfuric acid solution, by means of diethyl sulfate. Under varying conditions the products contain from 18.2 to 40.84 per cent of ethoxyl (OC_2H_5). They found that, unlike the preparation of the methyl ethers, a starting temperature of 50° C. is necessary.

These investigators also conducted experiments with ethyl chloride as the alkylating agent and, by using a high concentration of this compound, or repeated treatment at 100 to 115°C., finally obtained

Table III

SOLVENTS FOR THE ETHYL ETHERS OF CELLULOSE

Solvents	*Inventor or Assignee*	*Reference*		*Date*
Benzene and *B*-chloroethyl acetate	Matthews	U. S. Pat	1,469,816	1923
Alkylated sulfonamide derivatives	Dreyfus	Brit. Pat.	164,386	1919
Benzene, ligroin, or hydroaromatic substances	I. G. Farbenindustrie	" "	288,143	1928
Xylene and methyl, ethyl or other alcohol	Eastman Kodak Co.	U. S. Pat.	1,431,905	1922
Methyl acetate and methanol	" " "	" " "	1,432,374	"
Carbon tetrachloride and benzol	" " "	" " "	1,434,432	"
" " " ethyl acetate	" " "	" " "	1,434,465	"
Monochloronaphthalene and ethyl alcohol	" " "	" " "	1,437,792	"
Butyl acetate and methanol	" " "	" " "	1,469,825	1923
Mesityl oxide, methyl acetate, and methanol	" " "	" " "	1,469,826	"
Ethyl propionate and methanol	" " "	" " "	1,473,217	"
Epichlorhydrin and methanol	" " "	" " "	1,473,218	"
Ethyl succinate and methanol	" " "	" " "	1,473,219	"
Methanol, methyl acetate, and aniline acetate	" " "	" " "	1,494,469	1924
" " " " anthranilic acid	" " "	" " "	1,494,470	"
" " " " benzamide	" " "	" " "	1,494,471	"
" " " " benzoic acid	" " "	" " "	1,494,472	"
" " " " tribenzylamine	" " "	" " "	1,494,473	"
" " " " benzyl acetone	" " "	" " "	1,494,474	"
" " " " diphenylamine	" " "	" " "	1,494,475	"
" " " " phenyl benzoate	" " "	" " "	1,494,475	"

Table IV

SOLVENTS FOR MISCELLANEOUS ETHERS OF CELLULOSE

Type of Ether	*Solvent*	*Inventor or Assignee*	*Reference*		*Date*
Aliphatic	Alkylated sulfonamide derivs. or triacetin......	Dreyfus	Brit.Pat.	164,384	1919
Aralkyl	" " " " "	"	" "	164,385	"
Mixed alkyl-aealkyl	" " " " "	"	" "	164,385	"
Methyl	" " " " "	"	" "	163,386	"
Benzyl	Glycol mono- or di-formate	I. G. Farbenind.	Swiss Pat.	124,241	1927

triethyl cellulose. They also found that the water-soluble ethyl cellulose, containing 18.2 per cent of ethoxyl, could be ethylated further with ethyl chloride in the presence of sodium hydroxide, to give a product with an ethoxyl content of 38.85 per cent.

Hess and Muller[16] were the first to prepare crystalline triethyl cellulose by ethylating regenerated cellulose, from viscose solution, seven times with diethyl sulfate and sodium hydroxide at 50 to 55° C., obtaining a yield of 84 per cent of the theoretical of crystallizable triethyl cellulose. On evaporating a 0.2 per cent benzene solution of this product, crystalline triethyl cellulose was obtained.

Berl and Schupp's triethyl cellulose[18] is soluble in chloroform, dichloroethylene, benzene, and acetic acid. The melting points of the crystalline triethyl celluloses of Hess and Muller[16] varies between 240 and 250° C., depending upon the nature of the original cellulosic material used. These ethers are insoluble in water, but soluble or capable of swelling in many organic liquids. The solutions of triethyl cellulose are dextrorotatory, varying from a specific rotation of 11.50° in acetic acid to 49.1° in pyridine. Crystalline triethyl cellulose differs from the corresponding methyl compound in its insolubility in both hot and cold water.

Importance of Lieser's Discovery

Lieser[19] claims to have discovered a new cellulose methyl ether of the probable composition of $C_6H_{10}O_5.C_6H_9O_4.OCH_3$, in which only one hydroxyl radical in each cellulose $(C_6H_{10}O_5)_2$ unit is etherified. This substance is prepared, by way of cellulose xanthogenate, by treating purified cotton with an 18 per cent solution of sodium hydroxide, to form soda-cellulose. The excess of the alkaline liquor is removed by pressing and the soda-cellulose treated with carbon disulfide. The resulting cellulose xanthogenate is purified by washing with methyl alcohol and treated, in the presence of methyl alcohol, with a methyl alcoholic solution of nitrosomethylurethane, introduced a drop at a time at 32° C. Nitrogen is evolved and in about five hours monomethyl dicellulose is obtained. This is purified by washing with alcohol and water. This product is colorless, contains 6.7 per cent of methoxyl, and retains the original fibrous structure of the cellulose. It swells in caustic soda solution but is insoluble in organic solvents and cannot be converted into viscose.

The technical and scientific literature does not contain any reference to work upon the propyl or butyl ethers of cellulose although some work along this line has undoubtedly been done. With the rapidly decreasing cost of butyl alcohol, butyl cellulose may prove of interest. That some work has been done upon these products is proven by a patent[l] of the I. G. Farbenindustrie covering the preparation of mixed ethyl-butyl ethers of cellulose. A mixture of ethyl and butyl chlorides are used in this case, with colloidally dispersed cellulose.

Sakurada[17] has prepared the di- and tri-allyl cellulose ethers directly, by treating tissue paper with sodium hydroxide solution and allyl bromide. The triallyl ether is soluble in alcohol, benzene, and carbon tetrachloride, but its solubility is not as great as was expected.

In 1918, Jansen was granted a patent[m] in the name of the Deutsche Celluloidfabrik covering the product formed by the reaction of monochloroacetic acid on alkali cellulose. He referred to the product as "celluloseacetic acid," but there can be little doubt that it is a cellulose glycolic ether. It is prepared by allowing alkali-cellulose and chloroacetic acid to stand in contact at room temperature for some time. The resultant pasty mass is diluted with water, the excess of alkali neutralized, and the mixture poured into alcohol. The reaction product separates out as white, fiber-like flakes. It is insoluble in water but soluble in alkalies.

The reaction is probably represented by the following equation:

$$C_6H_9O_4.ONa + ClCH_2COOH \rightarrow NaCl + C_6H_9O_4OCH_2COOH$$

Since only one of the hydroxyl groups of the cellulose reacts, two unaltered hydroxyl radicals remain and these may react with other reagents. The free carboxyl group in the glycolic radical may be utilized to form a sodium salt. The resulting sodium compound is readily soluble in water, giving a viscous solution, but is insoluble in organic liquids.

Bayer and Company control a patent[n] covering the preparation of cellulose glycol ethers by the action of ethylene oxide on cellulose. In this process, dimethylaniline is employed as a catalyst and the reaction carried out at a high temperature.

Unfortunately, the glycol ethers prepared by either of the preceding methods, either swell or are soluble in water, so they must be further treated before they can be satisfactorily used for the manufacture of

synthetic yarns. Of course, this further increases the cost of manufacture.

At the present time four manufacturing groups are particularly active in the cellulose ether field. These are, the Dreyfus or Celanese group, the I. G. Farbenindustrie, the Eastman Companies, and Lilienfeld. The patents may be grouped under these four headings. On the other hand, at least four major uses for the cellulose ethers are apparent. These are the manufacturing of synthetic yarns, films, lacquers, and plastic materials. Each of these uses requires certain specific properties, so that more than one type of ether is desired and therefore, all of the patents do not have the same objective. On account of the number of patents upon the preparation of the ethers, only the fundamental patents, and their most important modifications will be discussed, and the reader is referred to the list at the end of the paper for further patent information.

Modifications of Lilienfeld Process

The original Lilienfeld process has been previously discussed. Since the granting of this patent[o] several modifications of major importance have appeared in the patent literature. One of the first modifications[p] covers the preparation of alkyl or aralkyl ethers of cellulose which are insoluble in water, but soluble in industrial organic solvents, by further etherifying previously prepared cellulose ethers containing a smaller number of alkyl or aralkyl groups. This process is conducted in the presence of small quantities of water, not exceeding five times the weight of the cellulose used as the primary material. Large quantities of caustic soda and correspondingly smaller amounts of etherifying agents are required in the second etherification.

The ethers may also be obtained[q] by impregnating the cellulose with caustic alkali solution and introducing the etherifying agent without removing the excess of alkali or subjecting the impregnated material to a ripening treatment. These ethers are claimed to be more water-resistant than those previously described. Preliminary treatment of the cellulose with solid caustic alkali in the dry state, or with so little water present that there is an excess of solid alkali, has also been recommended[r] for the preceding process.

On the first of January, 1922, Lilienfeld was granted a series of patents[s] covering the preparation of new alkali-soluble cellulosic ethers which are quite different from the former typical ethers of cellulose. These are prepared by warming the cellulosic material, an alkali-insoluble conversion product of cellulose, or an aliphatic acid ester of cellulose, with an alkylating agent and a caustic alkali solution so dilute that it is not capable of converting the cellulose into alkali-soluble conversion products without some other agency. The new cellulose derivative formed by this treatment can be isolated as a white flocculent mass by treating the reaction product with a slight excess of acid and washing with water. The resulting product is claimed to be insoluble in water and the usual organic solvents, but soluble in dilute (5 to 10 per cent) solutions of alkali. It is also claimed to be very reactive to esterifying agents at moderate temperatures.

On June 12, 1922, the first Lilienfeld patent[t] was granted covering the use of ethyl chloride instead of diethyl sulfate as the etherifying agent. According to this process, finely divided cellulosic material is mixed, preferably with cooling, with a previously prepared and cooled mixture of 50 per cent sodium hydroxide solution and powdered sodium hydroxide. The solution is heated in a revolving autoclave with ethyl chloride for 4 to 10 hours at a temperature of 110 to 150° C. The resulting mass is washed free from alkali with water at room temperature and stirred with dilute sulfuric or hydrochloric acid for a short time, washed free from the acid and dried. The final product is insoluble in water at 16° C. and above; swells slightly in water at 9 to 10° C.; and shows distinct swelling, without actual solution, in water below 5° C. It is stated that by doubling the quantity of sodium hydroxide solution used and increasing the reaction time to 8 to 12 hours, an ethyl cellulose is formed which is insoluble in water at 16° C., swells in water at 8 to 10° C., and dissolves at 1 to 5° C.

Conversion of Cellulose Ethers

Cellulose ethers which are soluble in water at room temperature may be converted[u] into the type just described by treating them with diethyl sulfate and sodium hydroxide under suitable conditions. The ratio of the alkali to the water content of the reaction mixture must be within the limits one to ten or one to fourteen. The proportion of water to alkali is claimed to be a very important factor in determining the properties of the resulting ether.

Lilienfeld claims[v] that in order to produce ethers of cellulose which invariably produce clear, hard, flexible films when dissolved in organic solvents, the proportion of water to alkali must not be less than $\frac{(a^2-a+2)}{4}$ nor greater than $\frac{(1.5a^2-1.5a+3)}{4}$, where a represents the amount of alkali used for each unit weight of air-dried cellulose. Open vessels or autoclaves may be used in this process, depending on the nature of the etherifying agent, but if open vessels are used, absorption of moisture from the air by the alkali must be taken into account. An intermediate cellulose ether may be isolated[w] during this process, if desired.

In the original Dreyfus process[x] for the manufacture of cellulose ethers, the cellulose is treated with a dilute alkali solution. The mixture is then dehydrated, by means of a vacuum, either dimethyl sulfate or

[q]British Patent No. 163,016.
[r]British Patent No. 163,018.
[s]British Patents Nos. 177,809, 177,810, 203,346, and 203,347.
[t] British Patent No. 181,393.
[u]British Patent No. 181,395.
[v]British Patent No. 200,815.

ethyl chloride dissolved in benzene is added, and the mixture heated to 50 to 60° C.

Before the patents of Lilienfeld had been granted in which the water content of the reaction mixture was so carefully specified, Dreyfus was granted a patent[y] in which the water content of the etherifying solution was carefully restricted by the addition of chemicals possessing a strong affinity for water, such as sodium oxide.

Modification of the Dreyfus Process

Phosphoric acid has been specified[z] as a suitable catalyst for the preparation of cellulose ethers. A recent modification of the Dreyfus process[A] states that the cellulose material can be treated with the etherifying agent, and allowed to stand for some time, before adding the alkali. The addition of a small amount of a basic material such as a carbonate or hydroxide, is desirable in order to avoid tendering the cellulose.

The earliest of the Farbenindustrie patents[B] covers the etherification of cellulosic material in the form of pulp or paper, by treating it with ethyl chloride at 100° C. under 5 atmospheres pressure, or with methyl chloride at 70° C. under the same pressure, while circulating hot nitrogen gas through the reaction mixture in order to maintain the desired temperature.

A modification[C] provides for the heating together of alkali cellulose and ethyl chloride in a closed vessel containing an inner perforated vessel charged with solid sodium hydroxide. The latter substances absorbs the water formed and dissolves gradually, thus falling into the reaction mixture.

Eastman Cellulose Ether Patents

The first of the Eastman Kodak Company's ether patent[D] covers the reaction of a mixture of cellulose and alkali with an etherifying agent in the presence of a large surface of "immunized steel." In another patent[E] the cellulosic material, alkali, and etherifying agent are all mixed together, the mass gradually heated to the reaction temperature, and this temperature kept constant for the remainder of the reaction period. A later patent[F] provides for the separate introduction of the reacting materials into the reaction vessel and agitating together with the application of heat. Nickel or nickel alloys are recommended as catalysts[G].

The majority of the Eastman patents have been concerned primarily with solution of the cellulosic ethers, rather than with their preparation or properties. These patents will be discussed later.

[w] British Patent No. 200,834.
[x] French Patent No. 462,274.
[y] British Patent No. 187,639.
[z] French Patent No. 632,616.
[A] British Patent No. 315,278.
[B] British Patent No. 275,660.
[C] United States Patent No. 1,694,127.
[D] United States Patent No. 1,437,820.
[E] United States Patent No. 1,437,821.
[F] United States Patent No. 1,464,158.
[G] United States Patent No. 1,489,315.
[H] British Patent No. 164,375.
[I] German Patent No. 492,062.

The Industry's Bookshelf

A Basis for Stability, by Samuel Crowther and others, 369 p., published by Little, Brown, Boston, Mass., $3.00.

Samuel Crowther interviewed twenty-one of the country's leading industrialists. Closely collaborating with him in the preparation of "A Basis for Stability" we can now read for the first time the opinions of America's business leaders on the very vital subject of how we may obtain stabilization of business and eliminate periods of depression. No two of the many suggested plans are identical. Naturally each executive has approached the subject primarily from the point of view of the industry with which he is directly connected. Mr. Crowther arrives at the very definite conclusion that we may plan so that we may eliminate the devastating periods of depression without entirely eliminating the very desirable periods of really good business. Mr. Crowther's chapters on the management of money are especially interesting.

A Textbook of Office Management, by William Henry Leffingwell, 190 p., published by McGraw-Hill, N. Y., $3.00.

Specially prepared for use as a textbook in business schools and colleges. Analizes in great detail every phase of office management in a way that can be understood both by the younger student and by those already actually engaged in business.

Vegetable Fats and Oils, by George S. Jamison, 444 p., published by Chemical Catalog Co. Inc., N. Y., $6.50.

An American Chemical Society Monograph. Combines within one volume a large part of the technical information now known on the vegetable fats and oils. Sources of supply, analyses, uses, etc., have been gathered together in a compact, easily discoverable form. As a matter of convenience there has been prepared both an alphabetically arranged table of the plant families under which the species are listed and a botanical index which contains in alphabetical order the species. In the book the fats and oils have been divided into three classes: the non-drying class containing those products having iodine numbers up to 100, the second, or semi-drying class, including those with iodine numbers up to 130 and third, those whose numbers are above the second classification.

Jobs for the College Graduate in Science, by Edward John von Komorowski Menge, 183 p., published by Bruce Pub. Co., Milwaukee, $2.00.

For those interested in any branch of science, who wish to enter the scientific field as a means of livelihood, who want to know the cost of training, the earning possibilities, the selection of scientific positions and the most important elements involved in each, will find in this book an answer to their every question. Dr. Menge tells prospective science students the personal characteristics they need for the different positions, and just what courses to take. He tells them of the approximate salary they can expect, working conditions, chances for advancement, and many pertinent details which will guide them to a career in the field of science that is best fitted to individual capabilities and most certain to bring the highest degree of success.

Planning for Economic Stability, by James Goodwin Hodgson, 219 p., published by H. W. Wilson, N. Y., 90c.

Suggested methods of bringing about a readjustment of conditions and a return to normal. The object of the compilation was to furnish a basis for the study of plans calling for a National Industries Board along the lines suggested by Stuart Chase and others.

The Course and Phases of the World Economic Depression, 355 p., published by World Peace Foundation, Boston, Mass., $3.00.

An unbiased survey of the world economic depression that should be read by every executive in the chemical industry. This study was made under the auspices of the League of Nations.

Price Sources of 1931, published by U. S. Dept. of Commerce Library, Washington D. C.

Affords research workers and others with a list of periodicals which give quotations on thousands of different commodities.

Statistics and the Changing Value of Gold

By Marcel Leveugle

EVEN when statistics are correct, there remains the more difficult task of interpreting them. Of course, in statistics expressed in weight, variations in volume are immediately seen. But we are concerned here with statistics in value, which are usually misleading and often have to be adjusted before accurate comparisons can be made.

The adjustment value is necessary because our instruments of measure are elastic, i. e. vary from year to year. What we expect of statistics for comparison is that they express true fluctuations in volume. In order to supply such an information, it is necessary to adjust. The adjustment consists in eliminating from the original figures the amounts of errors caused by one or more of the following factors:

1. Shifting gold value.
2. Shifting price of the products themselves.
3. Stabilization of currency.

Gold, like any other commodity, has not a "crystallized" value. This fact, however, was ignored until the 16th century, not only by the general public, but by economists who believed gold to be an invariable instrument of measure. This is now recognized as an error and shifting gold value is seen as the main cause of rise of general commodity prices.

Following the World War, the United States found itself with the largest stock of gold in the world, while most European countries have had to give up the gold standard. Whereas in Europe the unfavorable rates of exchange of most currencies seemed sufficient to account for the rise in commodity prices, in United States, where the gold standard had been maintained, another explanation had to be found. Overproduction, underconsumption, speculation, were considered as possible causes, but all proved inadequate to account for the steady rise of commodity prices in postwar years in the United States. Economists and general public were finally forced to admit that the cause lay in the gold standard: gold had lost in value.

This depreciation of gold is expressed by the index-numbers of general commodity prices calculated in gold. Below, we give a table of such index-numbers on the basis of 1913—100 for the four leading industrial countries:

All Merchandise	*United States*	*Germany*	*United Kingdom*	*France*
1924	140	137	166	137
1925	148	142	159	138
1926	143	134	148	120
1927	137	138	142	128
1928	140	140	140	129
1929	138	137	136	126

For the determination of world averages from the above table, it is best to disregard France, which shows a sudden drop in 1926, due to a rapidly declining exchange at that time. The average index-numbers for the world and by country are then found to be:

World Averages	
1924	148
1925	150
1926	142
1927	139
1928	140
1929	137

Averages by Country	
United States	141
Germany	138
United Kingdom	148
France	130

Let us remark here that only when dealing with all merchandise can shifting gold value be considered as the only cause of price variation. Indeed, it is obvious when considering goods as varied as those which constitute the total world trade, that specific causes of price variation peculiar to each class of products offset one another, so that both economist and statistician have the right to consider the factor "shifting gold value" as the only cause of error in calculations carried out to determine the true variations in volume over a given period. The above index-numbers however, are not calculated for all commodities, but for a number of products selected in fields so varied that specific causes are non-operative and the figures obtained may be considered as a true expression of shifting gold value, but, of course, inversely proportional.

If, instead of all merchandise, the investigation is confined to a single product, or group of products, or a limited number of different products, an additional factor occurs in the determination of true values:

the variation (increase or decrease) in the price of the products themselves.

Indeed, when studying the trade variations of a single product or a limited number of products, prices would change even if expressed in invariable gold, while, on the other hand, prices may remain unchanged in true value, although statistics record variations solely due to gold depreciation.

Such is the case when studying the entire chemical industry. The German periodical "Chemical Zeitung" recently gave the following index-numbers for 1926-1929, on the basis of 1913 = 100:

Chemicals	*1926*	*1927*	*1928*	*1929*
United States	132	135	135	135
Germany	120	119	119	119
United Kingdom	141	144	144	144
France	96	113	112	120

The averages are found to be the following:

World Averages		*Averages by Country*	
1926	122	United States	134
1927	128	Germany	119
1928	127.5	United Kingdom	143
1929	129.5	France	110

When a currency has for a number of years been depreciated in the world market and can no longer be expected to regain its legal value, a stabilization usually takes place. It consists in giving to the monetary unit concerned a new legal value in correspondence with its current market value. Whenever such a stabilization has taken place during the period chosen for statistical comparison, it must be taken into account when adjusting statistical figures to their true values, that is values representative of actual fluctuations in volume.

The above remarks, in emphasizing the necessity of handling statistical data very cautiously, plainly suggested that current statistical figures, unless properly adjusted, are likely to lead to erroneous conclusions. To prove this, we will give here two examples, which will at the same time show the reader the proper method of calculation:

Up to the opening of the present depression (end 1929), the total trade of the world, expressed in gold, showed, in comparison with 1913, a relatively steady growth. According to publications of the League of Nations*, the total recorded world trade was greater, in comparison with 1913, by about 12% in 1926, approximately 21% in 1927 and about 22% in 1928. These percentages express only illusive variations, for if account is taken of the fall in the value of gold expressed by the following index-numbers: 1926—142, 1927—139 and 1928—140, the trade figures 112, 121 and 122 must be brought down to: 78, 87, 87 respectively. The calculation is as follows:

$$\frac{112 \times 100}{142} = 78 \quad — \quad \frac{121 \times 100}{139} = 87 \quad — \quad \frac{122 \times 100}{140} = 87$$

It is easily seen that total world trade, just before the crisis was, in true value, below that of 1913, whereas the first percentages showed an increase.

*Memorandums on Production and Trade 1923-28/29 and 1925-29/30.
Memorandums on International Trade and Balances of payments 1926-1928 and 1927-1929.
Statistical Year Book 1930/31.

According to a publication issued in 1927 by "the Economic and Financial Section" of the League of Nations, the world chemical exports for 1913 and 1925 were the following:

1913: 3, 2 billion gold-marks
1925: 4 billion gold-marks

It is necessary to remember here that gold depreciation and the price variation of the products themselves must be taken into account, if accurate conclusions are to be drawn.

On the basis of 1913 (100), gold depreciation for the period 1913-1925 is expressed by the rise of general commodity prices, the index-number of which is approximately 150. On the other hand, we find that chemical prices taken by themselves have risen to 125 during the same period.

The calculation is the following:

$$1925: \frac{4 \times 100 \times 100}{150 \times 125} = \text{about 2 billion gold-marks}$$

It is easily seen that the international trade in chemicals was in 1925, in absolute value, about 30 per cent below that of 1913, instead of 25 per cent above the 1913 level as according to the first figure.

It is not claimed that the above calculation supply strictly accurate figures, reality is too subtle, too complex to obtain a true picture with figures, but the new figures will be found quite satisfactory for comparison purposes, as they are infinitely closer to true values than current statistical data.

Equipment Bulletins

Alsop Engineering Corp., 39 W. 60 St., N. Y. City has added several pages to their catalog describing the new Hy-Speed Asbestos Disc Filters. Considerable space is given to the description of the Asbestos Discs used in this type of filter. These new pages are now ready for distribution or the complete catalog showing the entire line of Hy-Speed liquid handling equipment may be obtained.

Atlas Valve Co., 282 South St., Newark, N. J. A new leaflet describing the Atlas Lever Operated Control Valve with the adjustable port opening.

Bailey Meter, 1050 Ivanhoe Road, Cleveland. Bulletin No. 112. This interesting booklet, printed in two colors, outlines the advantages, the mechanical construction, and various methods of installation of the Bailey Boiler Water Level Recorder. It describes the method for obtaining records of the true water level throughout the full range of the drum. A large number of illustrations are included showing installation photographs and reproductions of actual chart records. This bulletin has been written so that it appeals to power plant operators and engineers alike.

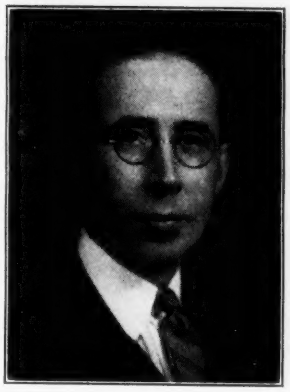
Parker Rust-Proof, Detroit. March issue of the "Parkerizer" is devoted to a description of the bonderizing process in use at the Toronto plant of Dominion Motors.

Richardson Scale Co., Clifton, N. J. New Bulletin No. 9130916 pages describes Richardson handling equipment for dry powdery chemicals. Illustrated.

Surface Combustion, Toledo. A description of how the production problem at the Kelsey-Hayes Wheel plant at Detroit was solved by continuous heat treatment. Profusely illustrated with photographs of the equipment installed by Surface Combustion.

Efficiency in Industrial Housekeeping*

By W. H. Winans†



POOR plant housekeeping—bad accident record. So much has been written on this subject that I shall not tire you with detailed instructions on how to wash the windows and how to remove grease spots from concrete floors. To make sure, however, we all have the same problems in mind, I will briefly list the major items which are commonly included under the heading "Good Industrial Housekeeping."

(1) Lighting
(2) Ventilation

Then we may list:

(3) Condition of buildings and appurtenances
(4) " " working floors
(5) " " machinery and equipment
(6) " " working tools
(7) " " work materials
(8) " " wash rooms, locker rooms, drinking fountains and toilets
(9) Condition of lunch rooms
(10) " " grounds, walks and roadways
(11) Disposal of waste

One of our plant Superintendents has put it this way, "Good housekeeping and Safety go hand in hand. Show me a plant where housekeeping is poor and I will expect both a poor accident record and poor quality of product manufactured."

There are three ways in which good housekeeping promotes Safety: actual removal of hazards; recognition of and guarding of inherent hazards; and attainment of right mental attitude.

I have never seen a dirty and disorderly plant with a good safety record nor a silk purse made from a sow's ear. Some synthetic chemical wizard may transform a sow's ear into rayon, but more than magic is required to make a disorderly plant safe.

Every plant which I have known to have a good safety record has included good housekeeping among such other essentials of successful accident prevention, as the following: Acceptance of management's responsibility for safe working conditions, equipment and methods; employee good-will and safety-mindedness of employees.

Even if a plant has all three of these, I do not believe a clean safety record can be achieved without good housekeeping conditions.

Obviously you cannot maintain buildings, equipment, materials and sanitary facilities in good condition without constant inspection, provision of adequate janitor service, proper storage facilities and efficient layout and arrangement. This means that tripping and slipping hazards, falling objects, blocked aisles and stairways, unsafe piling, unsafe tools and machines, litter and filth, will be eliminated—and that eliminates most of the causes of present day industrial accidents on the physical side. Then if you provide proper lighting and ventilation, there is little chance that hazards which are necessarily inherent in the work will be hidden or unobserved. When such hazards are known and constantly apparent they can be effectively safeguarded.

Finally we have the mental attitude of employees to consider. Good industrial housekeeping is merely one phase of good management. Therefore, we must start at the top. Orderly habits indicate orderly thinking. Good arrangement comes out of good planning. The manager, superintendent or foreman who sets an example of orderliness in his own appearance and work place can expect and can secure the same from his men—but not otherwise.

Cleanliness and orderliness are contagious. Men who love filth will not stay long in a clean plant. We are all tremendously influenced by our surroundings.

*Delivered before the N. Y. Meeting of the National Safety Counsel.
†Union Carbide and Carbon Corp.

Humans, animals and plants are alike in this respect.

The step from orderly-mindedness to safety-mindedness is a short one. To work safely means to constantly perform one's tasks in a manner and with equipment which have been designed to be as free from accident hazard as possible; to be aware of, and trained to meet, unavoidable inherent hazards; and to be alert for unknown or unexpected mechanical or human failures. That is what I mean by safety-mindedness. It must pervade the entire organization if it is to be accident free.

Quite naturally many different methods are followed in different companies. Some have organized special Sanitation Departments, some make the Safety Department responsible for housekeeping, some put the job up to the Medical Department, while a great many hold the regular line organization responsible for maintaining proper conditions throughout the plant and premises. Periodical inspection seems to be uniformly accepted as imperative. This is accomplished in many companies through rotating Committees. I understand the International Harvester Company has committees appointed by and supervised by the Works Councils.

Many companies have found inter-department contests very helpful in stimulating interest in housekeeping improvement. Ratings are assigned after each inspection. The common practice is to publicly post the comparative departmental ratings and to award a banner or other trophy to the winners. The booby prize in one of the du Pont plants, I understand, is a big black broom. All of you have doubtless noticed signs along the railroad "First Prize Awarded This Division for Excellence in Maintenance of Way." The value of such recognition is obvious.

May I use the words of our Toronto Works Superintendent to describe a plan which assisted that plant to operate for three consecutive years (almost 2,000,000 labor hours), without a lost time accident?

"This program is built around a novel plan for regular plant inspections which was inaugurated two years ago. Prior to that time there had been Sunday inspections and the housekeeping results had not been satisfactory. With the beginning of the new plan there was an immediate improvement, and the housekeeping has continued to improve ever since.

PLANT HOUSEKEEPING INSPECTION CHECK LIST

COMMITTEE:
GROUP: **DEPARTMENT:** **DATE:**

No. 1. BUILDINGS:
- a. Are walls clean for this Department ?
- b. Are windows clean for this Department ?
- c. Are walls free of unnecessary hangings ?
- d. Is proper light provided ?
- e. Are platforms in good condition ?
- f. Are stairs clean and well lighted, have they standard rails and standard treads ?

No. 2. FLOORS:
- a. Is floor surface good for this Department ?
- b. Is it swept clean, free of loose material, and is it clean in the corners, back of radiators, along the walls and around the columns ?
- c. Is it free of oil, grease, etc ?
- d. Are operating floors, or work positions, free of loose stone, scrap, metal or other materials ?
- e. Is the building free of unnecessary articles ?
- f. Are receptacles provided for refuse ?

No. 3. AISLES:
- a. Are aisles free of obstructions ?
- b. Is there safe and free passage to fire extinguishers, fire blankets and stretcher cases ?
- c. Is there safe and free passage to work positions ?

No. 4. MACHINERY AND EQUIPMENT:
- a. Is it clean and free of unnecessary material or hangings ?
- b. Is it free of unnecessary dripping of oil or grease ?
- c. Is position around it clean and free of rags, paper, etc ?
- d. Are lockers and cupboards clean and free of unnecessary material, both on top of them and inside of them ?
- e. Are benches and seats clean and in good condition ?
- f. Are drinking fountains clean ?
- g. Are toilet rooms clean and well ventilated ?
- h. Are proper guards provided and in good condition ?

No. 5. STOCK AND MATERIAL:
- a. Is it properly piled and arranged ?
- b. Is it loaded safely and orderly in skips, cars, trucks, etc ?

No. 6. TOOLS:
- a. Are they properly arranged in place ?
- b. Are they free of oil and grease ?
- c. Are they in good working condition ?
- d. Are tool rooms orderly and clean ?

No. 7. GROUNDS: (15' from outside wall or to 1st R. R. track)
- a. Is yard outside building free of refuse such as fruit peelings, scrap, wood, iron, etc. ?

"An inspection of the entire plant is made twice a month by a committee of three members selected from the supervisory staff, one of whom is either the assistant superintendent or the head of the industrial service department. The other two members are rotated so that each committee has one new member, one member serving for his second inspection, and one permanent member. Each supervisor selected to act as a rotating member serves for two consecutive inspections.

"Inspections are made at any time during working hours. In this way the factory foremen must keep their departments in good condition all the time, for it is not possible to be careless during operating periods and then spruce up at the end of the week in preparation for a Sunday inspection.

"A second important feature of the inspection plan is that the housekeeping conditions found in each section of the factory are given a percentage rating, making it possible after each inspection to compare the various sections in regard to the quality of their housekeeping. A bulletin board in a conspicuous location lists the sections in the order of their standing at the latest inspection. The rivalry between employees of the various sections supplies the necessary incentive for those in the good sections to maintain their standing and for those in the poorer sections to improve theirs.

"The bulletin board shows the actual percentage rating given each section at the latest inspection and also at the three previous inspections. It is easy, therefore, for each employee to see whether the housekeeping of his own section is improving or getting worse.

"At the Eveready Works the plant is divided into eleven sections for purposes of these housekeeping inspections. The division into sections is based essentially on supervision, no section including areas controlled by more than one department head. It is important that responsibility for conditions in any one section be not divided between two general foremen. An effort is made to equalize, as far as possible, the number of employees per section and the floor space per section.

"The basis of the percentage ratings given by each inspection committee is the following table of maximum points allowed for the different housekeeping factors:

Progress	30	points
Condition of equipment	20	"
" " stock and supplies	18	"
" " floors	10	"
" " windows	6	"
Removal of scrap	4	"
Condition of aisleways	2	"
Miscellaneous	10	"
Total	100	points

"The most important item in the rating is the one called "Progress" and refers to the thoroughness with which the section corrects the faulty conditions found at the previous inspection. One member of the inspection committee carries a copy of the previous inspection report, on which are shown the faults found then, and checks those items which have been corrected. The 30 points for progress are allowed on the basis of the proportion of items corrected. If there were six faults listed for any section on the previous report and five had been corrected, the progress points given at the current inspection would be 25. It is apparent, therefore, that no section of the factory can stand near the top of the housekeeping chart, if they neglect to eliminate faults found by inspection committees. A high rating is assigned to this progress factor, because the management feels that the prompt correction of faults noted by the inspection committees is extremely important in the maintenance of good housekeeping.

Responsibility of the Section Head

"At each inspection the numerical rating for each housekeeping factor (except progress) is an average of ratings estimated separately by each member of the inspection committee. The record of this final rating for each separate section of the plant, together with the list of faults noted, is supplied to the department head in charge of the section. Then it is his responsibility to see that the faults listed are corrected."

A report recently issued by the Policyholders Service Bureau of the Metropolitan Life Insurance Company on this subject, outlines the plan followed by Eastman Kodak Company in supervising plant cleanliness, as follows:

"The foreman of each department is held responsible for the cleanliness and orderliness therein, and he in turn holds each employee responsible for his individual work place or machine. Each foreman must oversee the orderly arrangement of stock, and the removal of unnecessary accumulations of material. He must train each employee to keep his or her work bench and machine in clean and orderly condition. It is felt that this method of educating employees not only promotes more satisfactory housekeeping conditions but cuts down on janitor service.

"The major portion of janitor service is done at night to avoid interference with the operations and to eliminate raising dust and dirt during working hours. Each man on the janitor force is assigned certain territories and definite duties. All floors are thoroughly swept every night, all washrooms, dressing rooms and toilets thoroughly cleaned, and all waste disposed of. In the spray coating departments, sprayer hoods are carefully and properly cleaned nightly. Grinding machines are cleaned once a month. Office floors are mopped twice weekly and telephones disinfected three times a week.

"The work of the day janitors' force is concerned with emptying waste cans, changing paper cuspidors (paper cuspidors filled with sawdust are used and are changed every day, the soiled ones are burned); cleaning stairs, halls, corridors, fire equipment, windows, wash rooms after the noon-hour, distributing towels and cleaning yards and sidewalks.

"Inspection of sanitary and housekeeping conditions, as well as fire hazards, is made nightly by the head watchman and his squad on hourly rounds. Conditions which need attention are tagged and reported to the head watchman who turns in a nightly record of all such findings to the Safety Supervisor each morning. The Safety Inspector makes inspection thrice weekly and reports all conditions needing correction to the Department Head or the Maintenance Department. Once a month the Safety Department makes a complete Sunday inspection of the entire plant and sends a report to the Plant Manager and to every Department Head. This report is closely followed up to see that corrective measures are applied."

NEW INCORPORATIONS

Manhattan

Columbia Dry Colors and Varnishes—A. L. Freeman, 233 Broadway . 200 com
Kaswood Chemical Co.—L. A. Schenfield, 475 5th Ave. . . . 20 com
Lumino Co., chemicals—The company, 152 W. 42nd St. . . . 100 com

Delaware

Imperiplas Products, Inc., Wilmington, Del., paints, varnishes—Corporation Trust Co. . . . $100,000 20,000 com
Rademaker Chemical Co., Wilmington, Del., manufacture chemicals, salt brines—Corporation Service Co. . . . 30,000 com
The Simonize Co., Wilmington, Del., paints—Corporation Trust Co. . . 250,000
United Oxide Co., Wilmington, Del., operate mines—Corporation Service Co . . . $500,000 50,000 com

New Jersey

Peerless Laboratories, Inc., Newark, manufacture polishes, chemicals—Carl Olsan, Newark . . . 100 com

Other Localities

Port Chester-Scott Corp. of Port Chester, chemicals—Sporborg & Connolly, Port Chester. . . . 200 com

What Have We Learned Since 1928?*

By Wilson Compton

AMERICANS in recent years have been inclined to view with considerable self-complacency and perhaps a degree of boastfulness the extent of our national resources and the assurances of enduring and impregnable prosperity which they were believed to imply. At the climax in 1928 of the so-called "New Era" in American industry, it was pointed out re-assuringly that with less than six per cent of the world's land area and less than seven per cent of the world's population, the United States was doing one-half of the world's recorded business; 55 per cent of the world's production of iron ore; 66 per cent of the world's steel; 51 per cent of the copper; 62 per cent of the petroleum; 40 per cent of the coal; 55 per cent of the cotton; 60 per cent of the lead; 85 per cent of the automobiles; 35 per cent of the railroad mileage; and 50 per cent of the timber.

Without debating the substantial correctness of these comparisons, it is at least fair to ask: What benefits are we now deriving from these facts ? Has our boasted superiority of production, by itself, become an element of strength or of weakness ?

The last decade saw the spectacular rise and the abrupt fall of the so-called "New Era." It was a modern substitute for old-fashioned and respectable economic laws. It had indeed respectable sponsorship—largely of ambitious banking institutions at a time when public fancy clothed finance with an omnipotence to make everybody rich, as great as its present impotence to protect anybody from sharing in the dismal consequences of depression.

The "new era" philosophy was the most alluring and the most expensive economic invention of the last half century. Men knew it wasn't so, yet believed it. It was fantastic, yet persuasive.

The Great American Anachronism

On more than one occasion we have been saved from economic misfortune, not so much by our well-planned economy as by the vastness of our natural resources, the fortuitous circumstance of rising general price levels, and the amazing diversification of our industry. We were in a fair way to becoming a nation of gamblers—gamblers, that is, with the future; taking long chances; relying upon improved technique to compensate for our economic indigestion. Had the turbulent boom of the 20's continued another decade we, as a nation, would have lost our moral bearings, our ethical perspectives, and our economic common sense. We had, in fact, already made considerable progress in that direction.

Technology by itself is not progress. Science itself never did anything. It never will do anything. It merely shows how it may be done. It is the advisor, but not the agent. It must be harnessed, controlled, directed. Mass production without due regard to orderly distribution and consumption has largely brought us into our present sorry plight. The problem of converting the technology of applied science into the useful terms of higher living standards is largely one of orderly economic organization and deliberate industry-planning which will establish dependable controls of production and distribution of commodities and maintain a reasonable balance between production and consumption. Neither the "new era" economics, nor Congress, nor the laboratories of science, nor the machines of industry can repeal the law of supply and demand, or, if we prefer the phrase, the necessity of balance of production and consumption. We may ignore it, as heretofore we have done, but we do so at our peril.

The impulse of scientific research; the conservatism of industry stabilization; and the security of insurance against the social consequences of depression in so far as it may be unavoidable are our obvious great economic needs. It is not these objectives themselves which are controversial nowadays, but rather the choice of ways and means of reaching them. Science is our greatest promise only if it continues the servant of man; our greatest threat if it become his master.

Stabilization without invention is stagnation. Invention without stabilization is chaos. The problem is not to choose between the two, but to devise the means of combining them in such a manner and under

*Abstracted from Schiff Foundation address at Cornell University.

such intelligent direction and control as to secure the largest net advantages of each. We have found that science and technology are merely a means to an end, not, as some have boastfully proclaimed, an end in themselves. Technology has given us the physical means of higher living standards; but not the means of avoiding impoverishment in the midst of plenty. Our problem, fortunately, is one not of irreparable famine, but of uncontrolled—although not uncontrollable—surpluses.

Balancing Production and Consumption

We may hope to derive substantial gains from deliberate forward-planning of production and distribution. It is in fact being done now with measurable effectiveness in many lines of industry and commerce. In criticism it has been said that this fact is only a temporary product of the exigencies of adverse economic conditions and that when the pressure is lifted these orderly controls, in so far as they depend on voluntary action, will explode. That so far is a mere opinion—an opinion which I do not share. I do not believe that the progress now being made toward the establishment of more orderly and dependable self-government in industry and commerce will ever be wholly lost. Nor do I believe that we need assume, as many nowadays are assuming, the ultimate abandonment of the ideals of individualism; and of the opportunity to make and to follow individual judgments. The so-called "social judgment" separate from the combined judgments of individuals is after all a mere convenience of definition. There is no thought without a thinker, no judgment without a judge, no action without an actor. In discussing social controls, we may abolish individualism on paper and by definition. But we cannot abolish it in fact and in the world of commerce. It may, it is true, be subjected to controls and limitations. It may be subordinated. It may be made impotent of effective expression. But it cannot be eliminated. The choice is not between the suppression of individualism on one hand and its uncontrolled freedom of action on the other. The more important question is whether it is desirable that individual initiative be suppressed or that it be given intelligent guidance and direction.

The eventual establishment of industrial self-control, if pursued along these lines, through the agencies of voluntary cooperation in industry and commerce may not unlikely fall along the following lines:

First. Establishment of dependable and enforceable controls of finance and credit. Credit has become the universal common denominator which may dilute or even dissolve an industry. Public control of the major credit instrumentalities and the major credit policies has been shown by impressive experience in recent years to be necessary to the security of industry and commerce. It has been said that the present general economic distress is due largely to the accumulated consequences of unwise and unwarranted past use of credit. If so, it is fair to say that the control of credit should be made so secure that no industry hereafter will be made the helpless victim of the ignorance, the recklessness, or the deliberate folly of another.

Second. Industry-planning to secure stabilization. This, with perhaps the general guidance of a suitable national economic planning agency, under auspices sufficiently impressive to command consideration and respect, may be undertaken by industries separately through their trade associations.

Third. Research, to insure the benefits of continuing technological progress.

Fourth. Insurance against the inevitable uncertainties and contingencies which seem to be inherent in any scheme to secure the benefits of both stabilization and improved technique, and at the same time to avoid the extremes of stagnation on the one hand and the economic chaos on the other.

Economic planning, under such auspices, ought to be effective in reducing "bad times" to a minimum. Beyond that minimum, the "good times" may be made equitably to pay the costs of tiding over the "bad times." Individualism, with science as a generator, stabilization through industry-planning as a conservator, and insurance as a security against the extremes of both, may I believe be made ultimately to provide an effective protection against the consequences of the adverse swings of the "business cycle."

But we must look even beyond our own borderlines. Politically we are isolationist. Commercially we are internationalist. We let not the right hand know what the left hand doeth. We seek to travel two forks of the same road at the same time. Then we wonder why we stumble. It is true that 90 per cent of our commerce is domestic, but the 10 per cent of foreign commerce is sufficient to have become to a large extent the decisive link in the chain. When something has gone wrong with us we cry for more tariff. As a security to high living standards the tariff has manifest justifications. As a refuge from the logical consequence of economic folly, it has none. A tariff which stabilizes domestic markets is a benefit. A tariff which destroys the opportunity of world-wide markets as a needed stabilizer is a curse.

Fallacy of So-Called "Cure-Alls"

Too much have we been seeking to relieve symptoms rather than remove causes of depression. Superficial expedients are alluring. They appear to promise quick results. But their benefits are in large part illusory. Political substitutes for second economic policies have done more harm than good.

We have even tried remedy by slogan. Talented sloganeers have assured us of the efficacy of such simple expedients as "Buy More," when we have nothing to use for money; "More Credit," when we

have already borrowed too much; "More Tariff," "Less Tariff," "No Tariff," *ad nauseam*; the "Dole"; a "Moratorium on all Debts"; "Prosperity Loans" of all kinds; and even that "The Government Should Make Everybody Rich." Some of us are still trying to pay our bills with slogans.

Symptoms or Causes

Is not the futility of many of our proposed devices for economic restoration in the fact that they are evasive Are we perhaps sparring with the visible symptoms of industrial and commercial disorder, yet not seeking a correction of the less visible but basic causes ? Never, I believe, in high places have we had in this nation a more earnest, more sincere, or more single-minded purpose to establish honest and constructive national policies. But the purpose has been thwarted to a substantial extent by political and economic prejudices; by the wavering and hesitancy of befuddled men and by the inertia of millions accustomed to perennial prosperity who look to time and the old-time "American Spirit" as the infallible cure-all.

I am well aware that the Sound must at times yield temporarily to the Expedient. But that fact does not justify the abandonment of sound ultimate economic and social objectives. As to what these are, opinions may differ. But of the wisdom of intelligently determining, and courageously pursuing them there may be no doubt. This is a matter of vital interest to every industry and to every man. The modern nation wide—even world wide—interdependence of industry and commerce, has made each industry the beneficiary, to be sure, of favorable conditions, but also the victim of adverse conditions, in other industries over which it has no control.

It is easy and has become rather customary to pass to "Uncle Sam" those puzzling problems which are not otherwise readily solved. But the Government is not wiser than its people. Moreover, there is little gain from avoiding the Scylla of exaggerated individualism only to fall into the Charybdis of enervating paternalism.

May I make mention without elaboration of a few of the objectives which, for such a purpose, seem to me to be fundamental:

First. Nation wide tax reform. The national annual tax bill of nearly 15 billion dollars is in effect a first mortgage on the incomes and the property of the American people. It absorbs between 15 per cent and 20 per cent of total income. More than one day a week goes to pay the costs—so to speak—of governing the other five. Business, industry and agriculture, operated not to meet the demands of the market for commodities or services, but to pay the "fixed charges" imposed in taxes, has become perhaps the most serious single handicap to the maintenance of orderly balance of production and consumption.

Second. Political and legislative recognition of our confirmed commercial internationalism. Without international accord on monetary, credit and commercial policies, desirable national economic security in any country may not be expected. Without it we may hibernate as a nation; or we may have the *form* of stabilization but not completely its *substance*.

Third. Organized means for deliberate planning of production and distribution of commodities as a logical and a necessary aid to the stabilization of industry and commerce.

Fourth. Greater freedom of action in industry, with reasonable safeguards in the public interest. With respect at least to the basic natural resource industries, with their peculiar and near-crushing economic burdens in the occupancy and administration of huge reserves of raw materials, there is reason to say that public and industry interest alike will be served, for the period of national economic emergency at least, by the suspension of the restraints of the law, in so far only as these laws relate to cooperation between competitors for the purposes of balancing production and consumption; stabilizing markets; maintaining employment opportunities; and conserving natural resources.

Fifth. Practical measures to secure flexibility and fluidity of labor and capital; and public policies for the planning and control of expenditures in public works for the deliberate purpose of national economic stabilization in emergency.

I may not discuss the merits of these suggestions. Most of them are debatable. At least they are debated. But they have at least this merit: They involve causes, not merely symptoms, of unbalanced production and consumption and their dismal economic consequences. The ideal in any event may be incapable of attainment. But it is capable of being striven for. Permanent achievement is rarely accidental. It is usually the result of purposeful, deliberate and intelligent planning.

Company Booklets

American Cyanamid, 535 5th Ave., N. Y. City. "Cyanamid in the Fertilizer Industry" describes the various methods for the utilization of cyanamid in fertilizer mixtures.

J. T. Baker Chemical, Phillipsburg, N. J. The March issue of the "Chemist-Analyst" features an article by Leo G. Dake on the "Camera for Microphotography."

Industrial Chemical Sales, 230 Park Ave., N. Y. City. "Palatable Drinking Water" describes the use of Nuchar (activated charcoal) in the treatment of drinking water. A very complete survey of the problem.

Mallinckrodt Chemical, St. Louis. The March price list of medicinal, photographic, analytical and industrial chemicals.

Monsanto Chemical, St. Louis. "The Thirtieth Annual Report and Year Book for 1931." A beautifully illustrated booklet giving the annual report of the company. Of more than glancing interest.

Philadelphia Quartz, Philadelphia. A very complete booklet describing the use of Metso sodium metasilicate for cleaning in the dairy industries.

Dr. Lewis H. Marks Honored by his Chemical Friends

"On St. Patrick's Day in the evening," seventy good friends of Dr. Lewis H. Marks, foregathered in the Chemists' Club, New York to pay a deserved tribute to the man through whose efforts not only has the Club building been remodeled, but even the very Club spirit and atmosphere revived.

It was a pleasant occasion. The inspiration of this tribute to Dr. Marks was spontaneous and sincere. It bound together a congenial group, generously grateful for the thought, the energy, the hours of hard work which he had donated freely to the common cause. The dinner and its appurtanences were excellent, and the speeches, thanks to the strenuous efforts of Mr. Lewis, who as Club President presided as toastmaster, were of that rare quality of brevity and wit, so much to be desired and so often wanting.

On behalf of his friends, a bronze placque commemorating his services as Chairman of the House Committee was presented to the Club, and short speeches made by Dr. G. B. Wagner, Prof. D. D. Jackson, Dr. Maxmillian Toch, General Herman A. Metz, John M. Weiss, C. C. Concannon, James P. McGovern, and Harry Mabey.

In replying, Dr. Marks modestly disclaimed the lions share of the credit in the work of renovating the Club House, and amusingly told some stories of the trials and tribulations of the committee with painters and plumbers, decorators and contractors.

N. Y. State Department of Labor maintains a Division of Industrial Hygiene, whose function is to study the sickness and accident problems of industry and to evolve preventive measures. With a staff of physicians and chemists and specially trained inspectors, this Division is prepared not only to give scientifically correct information to employers, but also to consider individual problems of workers, exposed to disease or injury in their occupations, and to give personal advice in such cases.

Under the direction of Mr. J. D. Hackett, this Division has made a special study of the health hazards of workers whose occupations require the use of chemicals, and has issued a series of Industrial Hygiene Leaflets. Their titles are as follows: Prevention of Lead Poisoning, Prevention of Arsenical Poisoning, Prevention of Silicosis Poisoning, Prevention of Mercury Poisoning, Prevention of Chrome Poisoning, Prevention of Benzol Poisoning, Prevention of Carbon Monoxide Poisoning, Prevention of Industrial Anthrax, Prevention of Occupational Dermatitis.

Foreign News

Reports from Great Britain indicate improved sentiment generally and particularly in the chemical industry. Prices are firm and shipments are in larger volume. Announcement was made, March 9, of the completion of an agreement between the Dyestuffs Cartel and the I. C. I. Details are not available as to just what points the pact covers but it is thought that they deal with the allocation of markets for certain products and greater freedom of trade in coal-tar intermediates. It is not thought that the present arrangement includes price-control of interchange of technical information.

Francis P. Garvan Attacks New Dye Cartel

German dye prices in England have risen 10 per cent in the past few months and it is expected that British made dyes will follow shortly. Francis P. Garvan, president of the Chemical Foundation attacked the agreement as a direct attack on American chemical industry. Said Mr. Garvan, "It is up to America to answer by developing her own industry, her own research and her own chemical education. This combination makes the disarmament talk nonsense. Chemistry is the main armament today. This means a military alliance of the whole world against America."

From Germany comes word that the Polish Government has approved the German-Polish potash agreement providing for a period of five years' participation by the Polish "Tesp" (Society for the Exploitation of Potassium Salts) in an agreement with the German concern.

England's Channels of Research

Of special interest in this country in view of the various beliefs as to the actual amount of curtailment in research that has been caused by the present business depression, is the British Sixteenth Annual Report of the Department of Scientific Research covering the period Aug. 1, 1930-July 31, 1931. It shows into what channels English research activity is being directed. The Report says in part: "The Cast Iron Research Association has developed the 'Silal' heat resisting alloys which are finding successful use in industry, and the application of the knowledge of moulding sands and refractories acquired as a result of the Association's investigations represents an estimated annual saving to the industry of about £100,000 a year. The Non-Ferrous Metals Research Association has been responsible for important advances in aluminum castings and in the comparative study of a range of bearing metals and their inter-action with representative lubricants. Investigations carried out by the British Refractories Research Association to improve the durability of refractory materials have an interest not only to the ceramic but also to the iron and steel and other industries concerned with high temperature operations, while much of the work carried out by the Electrical and Allied Industries Research Association is definitely related to matters of public safety and economy, for example, in the factor of safety and design of overhead transmission lines in the 'grid' system, and in the laying of electric cables at considerable depth.

The Paint Research Association has been concerned with the practical methods developed for the measurement of colour and the determination of colour fastness of pigments, and a table of fastness based on the quantitative methods developed is rapidly being accepted by the industry as the basis of colour valuation of pigments. X-ray methods are also being employed for the investigation of the structure of pigments, steels, metal deposition, and scales on steel.

The Cotton Industry Research Association has undertaken a long program of fundamental studies on the physico-chemical nature of dye solutions and of the dyeing process, and these co-ordinated researches should fill a gap of much technical importance in our knowledge of the relation of the nature of dye solutions to the mechanism of cotton dyeing and the properties of the dyed material. In addition, laboratory work on the effect of various finishing processes such as bleaching and mercerizing and on the properties of cotton dyed with different dyes, is already yielding results of industrial value, and technical control of the bleaching process has been considerably improved. In a search for new uses for wool, the Wool Industries Research Association has obtained from a mixture of cellulose, leather, rubber, and wool, various products which closely resemble leather and for which uses are being explored. The Launderers' Research Association has succeeded in developing graded washing processes in which by technical control cleaner fabrics can be more rapidly obtained without increased cost of materials than by the casual processes commonly used, and methods for the economical cleansing of greasy fabrics are being evolved.

The Leather Manufacturers' Research Association has made an important contribution to public safety by the development of a method of disinfection which can be used by any tanner as a routine method of liming his goods and at the same time sterilizing them against anthrax; attention is now being directed towards the development of a method by which the dry hides and skins may be disinfected at the port of entry into Great Britain. The Boot, Shoe, and Allied Trades Research Association is carrying out studies on the physical properties of leather which are intimately connected with the comfort and waterproofness of shoes. The Rubber Manufacturers' Research Association is assisting that depressed industry by discovering new uses for rubber."

"The work carried out under the Fuel Research Board has received a considerable amount of attention recently, particularly that concerned with the hydrogenation of coal. Equally important, however, are the physical and chemical survey of the national coal resources, the investigations on carbonization, gas production, treatment of tar to produce satisfactory fuel oils and motor spirit, coal-cleaning, and heat transfer which are proceeding quietly but steadily."

Developments in Water Purification

"Some of the work on water pollution is linked up with investigations at the Chemical Research Laboratory, where it has been found that base-exchange materials remove from water traces of undesirable metals such as lead, copper, and zinc, which may be present in solution. Apart from its other investigations on corrosion, low-temperature tar, etc., the Chemical Research Laboratory has also been responsible for investigations on a series of fluorene derivatives containing arsenic and a new group of arsenicals analogous to trypansamide, both of which possess promising therapeutic activity."

Gibbs Not Vorce Cells

Editor Chemical Markets:

In an article published in the February issue of "Chemical Markets" we feel that its wording is such that one not intimately acquainted with the chlorine industry might get a wrong impression as to the cell in use in our factories. We use the Gibbs cell which was invented by Mr. A. E. Gibbs, who is now our Advisory Technical Director and which was developed by our Company under his direction. This cell has been greatly improved in recent years and is in no way to be confounded with the Vorce cell. Of course Mr. Vorce has no knowledge of these recent improvements.

We would very much appreciate your making this correction, giving the correction its equal prominence in the original article.

PENNSYLVANIA SALT MFG. CO.,
Paul Freedley,
Manager, Development and Research.

Philadelphia,
March 2, 1932.

Chemical Facts and Figures

Sales Tax Defeated in House—Bingham, Anti-Poison Bill Introduced—Fish Attacks Nitrate Shipments to Japan—Naval Stores Trade Investigated—Davis Succeeds Carveth as R. & H. Head.

Will Rogers commenting in his daily dispatch to the *N. Y. Times* said of the federal tax muddle, "You see these things that they are taxing now, they are not a sales tax. No! No! Entirely different! This is just a tax on things you have to buy."

The remark seems to aptly sum up the feeling of the country generally about the queer antics of the lower branch of the Legislature in the past month. After giving considerable thought to the most pressing problem of the day—the balancing of the budget—the Ways and Means Committee working in harmony with the Treasury Department introduced, March 9 the new tax bill containing provision for a sales or turnover tax estimated to result in the raising of some 600 million dollars. Immediately party discipline went into the discard on both sides of the chamber and Speaker Garner and other leaders were unable to prevent the complete overthrow of proposed tax program, or at least that part of it pertaining to the sales tax.

Demoralization

After two days of complete demoralization the House heard Mr. Garner make an impassioned appeal for cooperation in balancing the budget, and in response, passed in the closing days of the month several new taxes and increased several old ones in the hope of stabilizing the federal financial situation. On April 1 the House completed the task of levying $1,032,400,000. The sentiment of the country has favored retrenchment in government expenditures. This the House signally failed to heed. The blame has been shunted back and forth between the executive and legislative groups but the fact remains that economy and reduction in non-essentials has been ignored. As the month closed the Treasury Department and the House leaders were in disagreement as to the total required to strike a balance between the proposed income and the expected expenditures for the coming fiscal year.

Roughly the new tax bill has increased alarmingly surtaxes on incomes almost to the point of confiscation; corporation income taxes; it raises the postal rates on first class mail from 2 cents to 3 cents; so-called nuisance taxes of the war period are revived in the case of autos, cosmetics, matches, beverages, sporting goods and cameras, chewing gum, radios, mechanical refrigerators, candy, safe deposit boxes, oil, etc.; it adds a tax of $2.00 a ton on coal imported. It includes a tax on dividends and a tax on stock sales. The stock market promptly reacted to this provision by going to a new low figure for the present recession. The bill now goes to the Senate where it is expected months will be consumed in further debate and change before the final enactment. Sentiment in Washington, at a low ebb for several days, has improved at least to the extent that it is now believed that the budget will be balanced and the country's credit standing maintained. With England reporting a balanced budget and a modest surplus and with the country aroused and demanding action it is the concensus of opinion in Washington that Congress will not fail to heed the clear mandate of these they represent.

THE MONTH REVIEWED

Mar.

- 6 Sales tax introduced in House (363).
- 8 I. C. I. joins dye cartel (362).
- 11 Industrial Alcohol Bureau issues new instructions (365).
- 12 Fish attacks nitrate sales to Japan (365).
- 15 N. Y. Board of Trade, Drug and Chemical Section Dinner (340).
- 22 Whelpley, "Cosach" head meets with financial interests (373).
- 22 Borax and boric acid radically reduced (387).
- 24 Alcohol Conspiracy trials end (367).
- 27 Tariff Commission opposes creosote oil tariff (365).

Deaths

- 6 D. L. Jacobson.
- 14 George Eastman.
- 28 Ellis Jackson.

Volatile Poisons

Senator Bingham (Conn.) paused in his anti-dry activities long enough to introduce Senate Bill 3853 which embodies the suggested legislation governing the sale of poisonous volatile substances intended for household consumption which he espoused last fall.

The bill proposes to regulate the commerce in poisonous volatile substances used for home consumption, and it defines the term "misbranded parcel, package or container" to mean a retail package for dispensing any volatile poisonous substance for household consumption not bearing a conspicuous and easily legible label containing certain information. It provides for the seizure and destruction of packages under certain conditions.

Products Mentioned

Further, it gives to the Surgeon General of the Public Health Service power to certify that other substances are dangerous to life or injurious to health, whereupon public hearings may be held in addition to those specifically defined. The products now mentioned include "1. Aniline and any preparation containing free or chemically uncombined aniline ($C_6H_5NH_2$) in a concentration of 5 per cent or more; 2. Benzol, otherwise known as benzene, and any preparation containing free or chemically uncombined benzol (C_6H_6) in a concentration of 5 per cent or more; 3. Carbon disulfide and any preparation containing free or chemically uncombined carbon disulfide (CS_2) in a concentration of 5 per cent or more; 4. Cyanogen and all volatile compounds of cyanogen (C_2N_2 or in its compounds CN) in a concentration of 5 per cent or more; 5. Ethylene oxide and any preparation containing free or chemically uncombined ethylene oxide (C_2H_4O) in a concentration of 5 per cent or more; 6. Formaldehyde, otherwise known as formalin, or any other preparation containing free or chemically uncombined formaldehyde (CH_2O) in a concentration of 5 per cent or more; 7. Methanol, otherwise known as methyl alcohol, and any preparation containing free or chemically uncombined methanol (CH_3OH) in a concentration of 10 per cent or more; 8. Nicotine and any preparation containing free or chemically uncombined nicotine ($C_{10}H_{14}N_2$) in a concentration of 10 per cent or more; 9. Nitro-

benzol, otherwise known as nitrobenzene, and any preparation containing free or chemically uncombined nitrobenzol ($C_6H_5NO_2$) in a concentration of 1 per cent or more; 10. Sulfur dioxide and any preparation containing free or chemically uncombined sulfur dioxide (SO_2) in a concentration of 5 per cent or more; 11. All halogen compounds of hydrocarbons in a concentration of 5 per cent or more; 12. Such other substances as the Surgeon General of the U. S. Public Health Service shall from time to time certify to the Secretary of Agriculture as having been found through practical experience or by laboratory investigation, to give off, in the course of household consumption, fumes, vapor, or gas dangerous to life or injurious to health; but before the Surgeon General shall so certify he shall give reasonable public notice and full opportunity for public hearing of all interested parties, and such substances shall not be considered as coming under this Act until six months after the Secretary of Agriculture has given public notice of such certification by the Surgeon General."

Alcohol Specifications

The Bureau of Industrial Alcohol, Dr. James M. Doran, commissioner, announced, March 11, changes in specifications for denaturing grade methanol. They will apply likewise to methanol used in making proprietary solvents, which formerly had a reading of 92 degrees, Tralles scale; while the denaturing grade was 91 degrees.

The requirement as to specific gravity of denaturing grade methanol has been changed from not more than 0.830 to not less than 0.81984, or 94 degrees, Tralles scale. On admixture with twice its volume of water, denaturing methanol must not show a distinct separation of an oily layer after three minutes at 25 degrees centigrade. Estev content has been changed from not more than 5 grams to not less than 3 nor more than 10 grams per 100 cubic centimeters. Bromide absorption requires sufficient pyroligneous bodies so that not more than 21 nor less than 14 cubic centimeters shall be required to decolorize a standard bromine solution.

Methanol employed is required to impart its characteristic odor and taste to ethyl alcohol with which it is mixed, thereby giving an unmistakable warning of its presence. The required impurities or ingredients must have been formed naturally in the course of destructive distillation. Product may, however, be a mixture of methyl acetone, methanol, and allyl distillation fractions.

The Tariff Commission released March 27 the results of its extended investigation on creosote oil and held that a tariff is not justified under present conditions. Creosote oil, at present on the free list, was investigated by the commission under a Congressional resolution.

The commission found that Great Britain was the principal competing foreign country and that imports from that country are comparable to domestic production for treating wood.

Total cost of production of domestic creosote oil, including transportation and other delivery charges to the principal markets in this country, was found by the commission to average 13.01c per gallon during the years 1928-30, while the corresponding cost of the commodity in the principal foreign competing country was 13.47c per gallon.

Muscle Shoals

With the House occupied almost exclusively with the problem of balancing the budget, the Muscle Shoals situation remained for the most part in the background during the past month. However; the House Military Committee reported the bill drafted by a sub-committee providing private operation of the Muscle Shoals development.

The bill provides the project shall be leased to private concerns, but if a private bidder cannot be found a government commission will operate it until a private bidder is obtained. Surplus power would be sold at the switchboard. The Senate committee reported the Norris Government Operation Bill.

Suit Filed

Announcement was made early in the month that the Department of Agriculture intended filing with the U. S. Court of Customs and Patent Appeals a suit to determine validity of basic government patents under which phthalic anhydride has been manufactured in the U. S. since 1917.

It Takes Balanced Men to Balance the Budget

—Boston Transcript

Patent involves high-temperature vapor-phase catalytic process of manufacturing phthalic anhydride, phthalic acid, benzoic acid, and naphthaquinones by mixing naphthalene gas with air or oxygen and catalyzing with vanadium pentoxide at temperatures between 350° and 550° C.

Fish Attacks

Washington news was considerably enlivened during the month by an attack by Representative Hamilton Fish (N. Y.) on the sale of nitrates to Japan. Said Representative Fish on March 12:

"What sheer hypocrisy, what a travesty it is for the Government of the United States, which took the lead in urging the Kellogg-Briand pact to renounce war as an instrument of national policy except for purposes of defense, to permit an American concern to furnish vast quantities of nitrate of soda, which is easily convertible into three-quarters as much of nitric acid, which in turn makes almost an equal amount of high explosives, to kill the Chinese or any other people with which we are at peace!

Thunder

"We have, in truth, become a potential, if not the actual, slaughter-house of the world for profit and greed of the manufacturers of munitions which will tend to drag us into every war. If we must go to war again, let it be in defense of the United States and not in defense of munitions makers. * * *

Mr. Fish's list of steamers sailing from Hopewell and the amount of nitrate of soda they carried, includes these vessels which had consignments to various ports in Japan:

Vessel	*Clearance*	*Tons*
Kirishima Maru (Japanese)	Jan. 17	1,000
Cingalez Prince (British)	Jan. 25	900
Silver Cypress (British)	Jan. 31	1,004
Yuri Maru (Japanese)	Feb. 19	1,200
Siamese Prince (British)	Feb. 23	500

These ships are listed as having taken such supplies to Mediterranean and French ports:

Vessel	*Clearance*	*Tons*
Clara (Italian)	Jan. 21	4,919
Keifuku Maru (Japanese)	Feb. 11	5,555

Valuable

The Tariff Commission has just concluded an analysis of actual imports under paragraph 5 of the Tariff Act of 1920, and makes available information not elsewhere published on the imports in 1931 of hundreds of chemicals and commodities so classified. This analysis is based upon data taken directly from consular invoices of imports entered as dutiable in the New York customs district in 1931, under that provision for articles not provided for by name or groups in the tariff act. These imports at New York consti-

tute approximately 71 per cent of the total imports under this paragraph in all customs districts.

Of the $1,197,504 reported in official statistics of the Department of Commerce as entering through the New York district, $996,226 (or about 5-6ths of the total) are covered in this analysis. This latter figure includes imports, valued at $105,556, entered under paragraph 5 but transferred to other paragraphs at the time of liquidation.

Imports entered in amounts valued at $500 or more amount to $782,596; those valued at less than $500 aggregate $63,074. Copies of the report are available through the Tariff Commission.

Fined

Fines totaling $72,003 were imposed, March 24, in the Federal court at Baltimore on corporations and individuals pleading nolo contendere in the alcohol conspiracy trials as follows:

U. S. I., Amazon Industrial Chemical Corporation, American Solvents and Chemical and the Glidden Company, $10, 000 and costs.

American Oil and Supply, Filben Chemical Company, I. Sagovitz & Sons and North Hudson Chemical Company, $5,000. Max Sagoritz, $2,500.

Syrup Products, Joseph J. Darvin, Nate Scharlin, Louis Fredella, Rudolph Lesser and John A. MacGruer, $1,000.

Darvin and Scharlin were sent to jail for six months. Similar sentences on the other individual defendants were suspended.

The government on March 30 ended its prosecution of the alleged alcohol conspiracy, when Judge W. Calvin Chestnut, in Federal Court, imposed a $1,000 fine on R. & H.

The fine brought the total imposed upon firms and individuals in the cases to $94,000.

The first Year-book of the Chemists' Club, N. Y. City, published in 1899, contained the names of the one hundred and seventy-nine Charter Members, a little more than one-tenth of the present membership. Thirty-four of these original members are still living and have retained their membership to the present time, namely among these are the names of: O. P. Amend, L. H. Baekeland, S. H. Baer, V. G. Bloede, M. T. Bogert, F. D. Crane, F. E. Dodge, I. W. Drummond, A. Eimer, W. H. Erhart, Viscount Exmouth, B. T. Fairchild, H. H. Fries, J. F. Geisler, F. H. Getman, S. A. Goldschmidt, W. M. Grosvenor, D. D. Jackson, A. W. H. Lenders, A. D. Little, W. P. Mason, G. W. Miles, W. S. Myers, J. R. Pitman, G. A. Prochazka, A. H. Sabin, S. S. Sadtler, J. H. Stebbins, M. Toch, C. E. Uhlig, W. H. Watkins, D. Wesson, A. W. Wilkinson, F. G. Zinsser.

COMING EVENTS

American Drug Mfrs. Association, Greenbrier, White Sulphur Springs, Apr. 18-21.

American Institute of Chemical Engineers, spring meeting, Schenectady and Corning, N. Y., June.

American Leather Chemists' Association, Atlantic City, May 25-27.

Electrochemical Society, Spring Meeting, Baltimore, Apr. 21-23.

National Petroleum Association, Semi-Annual Meeting, Hotel Cleveland, Cleveland, April 21-22.

Naval Stores

Investigation of nearly thirty phases of the naval stores trade, in an effort to reduce enormous wastes in this industry, is now being conducted by the Department of Agriculture.

Dr. W. W. Skinner, Bureau of Chemistry and Soils of the department, who is in charge of the work, has just returned to Washington from Lake City, Fla., scene of the investigations, where he assisted in organizing a program of practical experiments and demonstrations by which it is planned to assist Southern naval stores producers. Besides the Bureau of Chemistry and Soils, the forest service of the department and the pine institute were present at the meeting.

Preliminary work of the bureau has indicated that under unfavorable conditions a large part of the turpentine produced by the pine tree may be lost after the sap exudes from the tree and before the turpentine is recovered in the barrel, Dr. Skinner held.

It is now known, he said, that the cheapest organic acid available for some chemical operations may be obtained from rosin, and study of the acids of rosin will be pushed at this station in order to obtain information permitting wider use of this important acid.

Western Borax recently won a suit brought against it for $1,000,000 in Los Angeles by L E. Siebert, W. M. Balling and Frank Tachudy, borax deposit owners in Kern County, Calif. Plaintiffs had charged that they quit-claimed their borax deposits to the borax company under an agreement that they receive an interest in the corporation in stock, and an addional agreement that the defendants would spend $500,000 in developing the mines.

Unfounded

J. S. Zinsser, president, Zinsser & Co., issued the following statement March 29 concerning the recent purchase by Calco of part of the Zinsser equipment.

"While Zinsser & Co., recently sold that part of its plant which was used for making alkali blue printing ink to the Calco Chemical Co., this sale has not affected their manufacture of textile specialties, photographic chemicals, dyestuffs and lake colors. An impression seems to have spread in the trade that Calco has acquired Zinsser & Co., in its entirety, which is absolutely incorrect. Zinsser & Company is controlled by Mr. F. G. Zinsser, the founder of the company. Practically all its stock is held by its officers and employees—no other corporation has any interest in it whatsoever."

Sold

International Combustion Tar & Chemical Corp., one of the largest coal tar concerns in the world, has been sold to P. C. Reilly, president of the Republic Creosoting Co. of Indianapolis. The International company was a subsidiary of the International Combustion Engineering Corp. and operates plants in Newark, N. J.; Chicago; Granite City, Mo.; Dover, Ohio; Chattanooga, Tenn., and Fairmount, W. Va. It has been in receivership since the spring of 1930, but has continued in active operation. The purchase price was not revealed. The purchase was negotiated by Mr. Reilly alone and the Republic Creosoting Co. has no concern with it.

Hercules Changes

J. E. Lockwood, for the past 12 years connected with Hercules Powder's naval stores activities, announced his resignation, effective April 1.

Mr. Lockwood, who has been active in naval stores work for 24 years, will open his own office in Savannah, Ga., where as a consulting engineer, he will specialize on naval stores problems and their solution and naval stores possibilities and their development. Hercules Powder Company has retained Mr. Lockwood as a consultant to act in an advisory capacity in respect to naval stores matters.

George M. Norman appointed manager of the development department of Hercules Powder. Mr. Norman, who is a director of the company, has been head of the technical department, the divisions of which will now function separately. H. E. Kaiser will supervise research and experiment and G. E. Ramer will supervise engineering activities.

J. M. McVey appointed assistant manager of the development department. Charles A. Higgins, vice president, who formerly directed development work, was assigned increased executive responsibilities.

PURE

and COMPLETELY

or

SPECIALLY DENATURED

ETHYL ALCOHOL

DU PONT

REG. U. S. PAT. OFF.

SPOT *or* CONTRACT

Opportunities to compete for your business will be appreciated.

E. I. DU PONT DE NEMOURS & CO., INC., Alcohol Division—Wilmington, Delaware

Penn Charcoal & Chemical purchased plant of Smethport Wood Products Co. at Smethport, Pa. Plans are completed for extensive alterations and it is expected to resume operations early in April.

Verona Chemical, Newark, N. J., has arranged with its research and manufacturing departments to offer to interested parties a complete range of consulting chemical service.

Texas Gulf Sulphur is to be sued for alleged back franchise taxes into court unless the amount is paid, according to John Martin, "blue sky" commissioner. The company has paid $41,000 of alleged back franchise tax, but the State is claiming a total of $380,000. Mr. Martin said the back tax claims are based on information obtained from the income tax reports.

Old Hickory Chemical at Old Hickory, Tenn., returned to a 48-hour week basis to conform to the du Pont policy recently announced according to Iver C. McDougal, Manager. "We have been able to absorb all of the surplus white labor without the necessity of laying off any employees," Mr. McDougal stated, "and production which is now about the same may be increased in the spring."

Alsop Engineering, N. Y. City, completed the final equipping of its testing laboratories and is now ready to run exhaustive tests for companies desiring experimental work done in conjunction with mixing and fltering problems.

Atlantic Gulf and Fertilizer Association Co., Jacksonville, awarded contract to supply $100,000 worth of fertilizer to the U. S. Sugar Corp.

Republic Chemical Corp. organized at Detroit to manufacture and sell chemicals.

The Kron Co., formerly American Kron Scale removed its offices and plant from N. Y. City to Bridgeport.

Linde Air Products is in a position to supply a full line of cylinders for the transportation of refrigerant gasses such as sulfur dioxide, methyl chloride, ethyl chloride, isobutane, butane and propane. The cylinders are suitable for portable or stationary use and are made strictly in accordance with the rules and regulations of the I. C. C.

Paper Makers Chemical, Ltd., is the new name of the former Vera Chemical Co. of Canada, Ltd., according to an announcement from the Freeman, Ontario, office of the corporation. The Canadian corporation is affiliated with Paper Makers Chemical Corporation in the United States.

Company News

Socony-Vacuum purchasing dept., at 26 Broadway, N. Y. City will now make purchases in behalf of Standard Oil Company of N. Y., Vacuum Oil, Socony-Vacuum Specialties Inc. and Standard-Vacuum transportation.

Neville Company of Pittsburgh and its representatives, E. H. Haines Distributing Co. of Chicago, announced new high boiling, high flash, slow evaporating, refined coal tar solvent known as 2-50-W. It is characterized by high solvent strength and mild odor and is used extensively with synthetic resins requiring a strong solvent.

Du Pont announced "Dulux White," a revolutionary new finish for exterior painting. The product, the company states, is put on the market after five years of exhaustive tests.

Murray Oil Products, Philadelphia, announced establishment of office and warehouse at 2320 W. 3rd St., Cleveland, for convenience of the industry in that city and area. George D Paine, well known in the trade through his long connection with the company, is in charge as manager.

W. G. Halthusen and C. I. Lamb have incorporated the New Mexico Potash & Chemical Co. and are drilling near Carlsbad, N. M.

Michigan Alkali's new plant for production of solid carbon dioxide at Wyandotte, which went into operation April 1, has a daily capacity of 150 tons. For its raw material it will use a portion of the carbon dioxide gas given off by the fusing of limestone and coke in the production of soda ash, one of the major operations of the company.

C. W. Campbell Co. moved to 157 Chambers St., N. Y. City on March 21, the new telephone number, Barclay 7-1744.

American Manganese Bronze of Philadelphia has taken over the entire business of the Caskey Brass and Bronze Works, Inc., of Philadelphia, specialists in the production of nickel, monel and nickel alloy castings.

California Chemical Corp., Sierra Magnesite Co., Ltd., National Kellastone Co., have discontinued their San Francisco office and moved general offices to Newark, California.

DeHart Paint & Varnish Co., Louisville, formed a month ago with plans for producing a complete line of paints, including industrial, farm and shelf goods, reports that company is now in production.

Rubber Service Laboratories Division of Monsanto is introducing to rubber companies new accelerator named "Ureka-C". This new accelerator, it is claimed, will not "scorch" during vulcanization or curing, and can be used in white rubber stocks without discoloring. This is the second new product announced by Monsanto this year. Early in January their tricresyl phosphate was introduced to the lacquer industry.

C. V. Kendall acquired the charcoal department of Binney & Smith. Mr. Kendall has entered the business with his son, Harold V. Kendall. New firm, which will be known as Kendall & Kendall, will be located at Blakes st., New Brunswick, N. J.

Stedman Foundry & Machine, to meet the growing demand for better screening of fertilizer and similar materials, have developed their QUADREX Vibrating Screen. Screening efficiency, simplicity of design and rigidity of construction are the outstanding features of this screen.

Mahoney Terminix & Wood Preserving Corp., Jacksonville, Fla., recently placed in operation the first plant in the Southeast using the new wood preserving system developed by the Bruce Chemical Co. and installed in connection with a treating unit designed by the Moore Dry Kiln Co.

Imperial Color Works appointed William C. Cooper to its New York staff. Mr. Cooper, who has had wide sales experience, will represent Imperial in the Metropolitan area.

Evans Chemical, organized at Buffalo, N. Y., to manufacture and sell chemical products.

Mutual Chemical, F. W. White, president, announced the addition of E. J. Barber to the sales department. Mr. Barber recently resigned from the American Cyanamid, where he was divisional sales manager of the industrial chemical division. Previous to this he was connected with White Tar.

Givaudan-Delawanna's plant awarded perfect safety record by the New Jersey State Department of Labor.

Paterson, Boardman & Knapp announced March 21 "We take pleasure in informing you that we have transferred the business of our gum department to the firm of Thurston & Braidich of New York. This in no way affects other articles dealt in by us and business will be conducted in them as heretofore.

"Charles F. Walden has resigned from the firm of Paterson, Boardman & Knapp and will undertake the management of the varnish and lacquer gum department of Thurston & Braidich. All foreign connections are being maintained, assuring a continuation of usual gradings."

Personnel

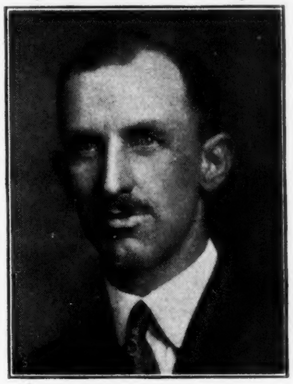
U. S. I. Vice-President

A. L. Loebenberg elected to vice presidency of the U. S. Industrial Chemical.

Mr. Loebenberg is well known in chemical industry with which he has been identified in important executive capacities for many years. A graduate of the M. I. T., he was formerly director of manufacture and subsequently vice president in charge of sales of the National Aniline. He was previously plant manager of Beckers Aniline & Chemical Works, Inc., which was developed into one of the most important factors in the American dyestuffs and organic chemical industry. More recently he has acted in the capacities of vice president and general manager of subsidiaries affiliated with American Machine & Metals, Inc.

Promoted

H. M. Harker and F. B. Langreck were elected assistant vice-presidents of Monsanto in recognition of valuable services



H. M. Harker
Long service is recognized

rendered to the Company at the recent meeting of the board of directors. Mr. Langreck is works manager at Monsanto, Illinois, and Mr. Harker has been director of purchases and more recently assistant sales manager.

Lester Bacharach, who has been associated with industrial alcohol industry for many years, having served in an executive capacity with various leading alcohol companies, acquired the entire interest in a former industrial alcohol and solvent chemical plant at Philadelphia.

Mr. Bacharach stated that he was unable to make any detailed statement, but pointed out that he had developed a new process in connection with by-products.

L. M. Bogle, formerly with the Atlanta office of H. J. Baker & Bro., opened office of his own to engage in the sale of fertilizer materials, located in Citizens and Southern Bank building, Atlanta.

J. N. Bryant elected president Josey Guano Co., Wilmington, N. C. Other officers elected were: John T. Hoggard, vice-president; L. A. Paisson, secretary-treasurer and manager; D. H. Penton, chairman of the board; J. A. Brothers, assistant manager.

R. & H. President

Charles K. Davis, president du Pont Viscoloid elected a director of E. I. du Pont de Nemours and president of R & H, succeeding Dr. Hector R. Carveth in both positions. Arnold E. Pitcher succeeds Mr. Davis in his former position.

H. B. Glass, formerly Swann Research, is now temporarily with the Wallace & Tiernan of Belleville, N. J.

Edwin P. Jones, until recently employed by Victor Chemical, has become director of research of The Champagne Paper Corp.

John C. Wolke now associated with L. Sonneborn Sons, Inc. Mr. Wolke formerly was associated with Stanco, Inc.

Greer McIlvain, for several years a member of the board of directors of National Fireproofing Corp., elected a vice president of the corporation.

J. Butler and A. J. Theme severed their connections with American Solvents & Chemical.

Edward S. Wright joined the Swann Chemical Co., with offices in the Graybar Building.

Clifford Sloan elected vice-president in charge of sales of the Standard Varnish Works, Chicago. He is a brother of Alfred P. Sloan, Jr., president of General Motors and is also president of the Standard Varnish Works of Michigan.

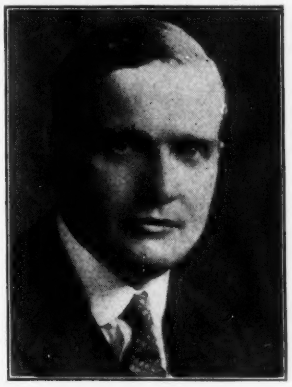
Joseph W. Jackson, formerly traffic manager American Solvents & Chemical, appointed vice president in charge of the institute's traffic administration division, which is engaged in conducting surveys and analyses of the traffic, transportation and shipping interests of industrial and commercial organizations, and developing methods and systems for greater efficiency and economy in their operations and practices.

Paul B. West, manager, advertising and sales promotion division of National Carbon appointed secretary-treasurer and managing director of the Association of National Advertisers, Inc. Mr. West succeeds Albert E. Haase, whose resignation became effective Feb. 15.

William S. Gray, Jr., president William S. Gray & Co., elected a director of the P. Lorillard Co.

Personal

Dr. Hugh Scott Taylor, chairman of the department of chemistry and who holds



Dr. Hugh S. Taylor
Receives foreign honors

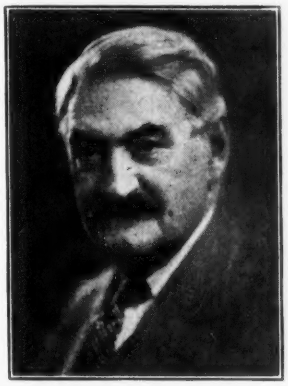
the David B. Jones Professorship of Chemistry at Princeton University, nominated for election as a fellow of the Royal Society of London, according to cable advices received March 7 at the university.

L. A. Belding, manager of the special car division of General American Tank Car spoke before the Engineers (N. Y.) Club on March 24 discribing the new tank car known as the dry-flo for handling dry materials.

Francis P. Garvan, attacked the faculty at Yale as "panic profiteers" and suggested that the salaries of teachers be reduced 25 per cent to make up the university's deficit of $514,000.

Feted

John F. Queeny, Chairman of the Board of Monsanto Chemical Works, was honor guest at a special dinner given for him at



John F. Queeny
Associates join in celebration

The Racquet Club in St. Louis, March 21, as a tribute to his sixtieth anniversary of continuous activity in the chemical industry. About twenty friends, associates and company executives attended.

Clarence P. Harris, industrial chemist of 522 Fifth ave., N. Y. City moved to 174 Madison ave.

Chlorine
Caustic Soda
Sulphur Chloride
Carbon Bisulphide
Carbon Tetrachloride
Alumina Hydrate

Phosphoric Acid
Mono Sodium Phosphate
Di Sodium Phosphate
Tri Sodium Phosphate
Sodium Sulphide
Barium Peroxide

A Steady Growth for YOUR Profit

Highest Purity plus 100% Service

THE Warner Chemical Company more than fifty years ago recognized the need of affording technical aid for the problems of their customers. In the little original plant the control and research departments played an important role.

Leadership in Service, Prestige and Quality of Product has been constantly maintained.

Today Warner and Warner customers are reaping the rewards of Highest Standards set nearly half a century ago.

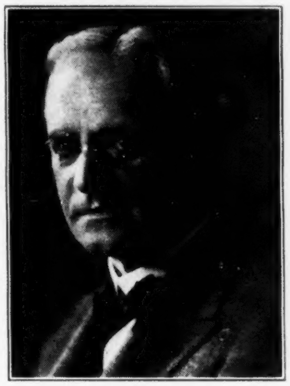
The WARNER CHEMICAL Co.

PIONEER PRODUCERS 1886

CHRYSLER BUILDING — NEW YORK CITY

Manufacturers of Industrial Chemicals and Distributors for Westvaco Chlorine Products, Inc.

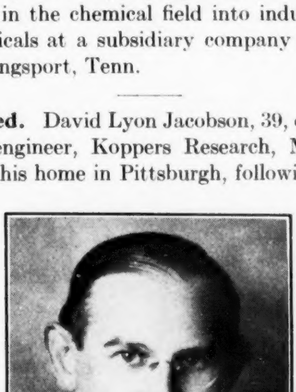
Died. George Eastman, founder, chairman of the board, Eastman Kodak committed suicide March 14. He was born July 12, 1854, at Waterville, N. Y., and would have been seventy-two years old on July 12 next.



Noted for his philanthropy the world over Mr. Eastman was mourned not alone in this country but in the countries of Europe where he established many children's clinics and other charitable institutions.

Mr. Eastman's most notable contribution to the advancement of the chemical industry was the founding, many years ago, of a department for the manufacture of a complete line of rare chemicals unattainable elsewhere in this country. He was one of the five leading chemical industrial executives nominated for the Chemical Markets Medal two years ago. Only recently his company expanded its operations in the chemical field into industrial chemicals at a subsidiary company plant at Kingsport, Tenn.

Died. David Lyon Jacobson, 39, chemical engineer, Koppers Research, March 6, at his home in Pittsburgh, following an



attack of pneumonia. Mr. Jacobson, was educated at Columbia and M. I. T., where he received the degree of bachelor of science in chemical engineering in 1916. He then entered professional work as a chemical engineer with Corn Products. A year later he joined The Koppers Co. of Pittsburgh to engage in research work at its Seaboard Jersey City Plant. Later he moved to Pittsburgh. Mr. Jacobson was the inventor of several processes for the removal of sulfur from gas, some of which are widely used at the present time. Mr. Jacobson was the editor of the American Edition of Doctor Gluud's International Handbook of the By-Product Coke Industry, which is now in press. Mr. Jacobson contributed several articles to Chemical Markets at various times, the last one appearing in the October, 1931 issue.

Died. Ellis Jackson, pioneer Philadelphia manufacturer died in his sleep on March 28 at his home in Ardmore, a suburb of Philadelphia after five years of ill health. He was in his seventy-first year.

Born in Fort Washington, Mr. Jackson had been in the chemical business for forty years. Mr. Jackson was a member of the Union League, the Racquet Club and the Philadelphia Country Club. His widow, the former Miss Carrie Ayres, is active in women's clubs and is vice-chairman of the Cooperative Shop of Philadelphia. His other survivors are a daughter, Mrs. Lois Loring Jackson Van Slyck of New York, and three grand children.

Died. William B. Pearsall, 39, Secretary, Pearsall Co., fertilizer manufacturers of Wilmington, N. C.

Killed. Gordon George, 38, superintendent of the San Francisco borax plant, Borax Union, Inc., was shot and killed March 2 at the plant by an unidentified person. Mr. George was a native of Canada, and was a nephew, by marriage, of the late F. M. ("Borax") Smith. His wife and two infant sons survive him.

Jacques Riedweg, of L. Givaudan & Cie, Paris, French affiliate of Givaudan-Delawanna, was the guest at a farewell dinner, March 8, prior to his departure for France.

W. H. Dickhart, for twelve years associated with the Bureau of Chemistry, N. Y. Produce Exchange, opened a laboratory at 189 Franklin St., N. Y. City, as consulting chemist to the oil, fat, and wax industries.

Joseph Turner was at Pinehurst during the month.

Charles Belknap, Merrimac president, and executive vice president, Monsanto delivered an address at a meeting of the New England Purchasing Agents' Association, Inc., held at the Hotel Vendome, Boston. His subject was "The Business Situation and Some Remedies."

E. S. Kaiser, purchasing agent, Jones Dabney Company, elected president of the Purchasing Agents Association of Louisville.

Married. Miss Brita Wolffram, daughter of Mr. and Mrs. Bengt B. Wolffram, of Upsala, Sweden, to A. K. Hamilton. Mr. Hamilton is manager of the alcohol division of Pennsylvania Sugar.

William E. Wellman is now a broker in fertilizer materials, heavy chemicals, and related products. Mr. Wellman was, for twenty-seven years, connected with the E. J. Walter Company and was its secretary-treasurer during the past fourteen years. His offices are at 806 Keyser Bldg., Baltimore.

Among the portraits by American artists, displayed in the Anderson Galleries, N. Y. City, by the American Art Association in the loan exhibition sponsored by Mrs. William Randolph Hearst, is a portrait of Charles Edward Crowley, vice-president, Alsop Engineering. The painting is the work of Alfred Everitt Orr, a silver medallist of the Paris salon.

Alcohol Plants

The Bureau of Industrial Alcohol issued March 11, detailed instructions requiring all alcohol plants to be resealed.

These instructions call for the preparation of special drafts of plans, and blueprints will not be accepted. Special emphasis is laid on the color scheme provided for pipelines, and it is required that plans permit the tracing of all such lines from beginning to end.

A new type of seal has been approved, and all equipment must be ready for sealing with the new seal before May 10.

"Cosach" Finances

Medley G. B. Whelpley, "Cosach" president who returned March 22 from a conference with the Chilean Government regarding the status of the corporation and the basis for future operations in

M. G. B. Whelpley
Recently returned from Chile

view of the overproduction in the nitrogen industry throughout the world, announced that his conferences had been both "illuminating and satisfactory."

He immediately went into conference with leaders of the various financial factions interested in the enterprise in the hope of effecting new financial arrange-

ments. To date the results of these meetings have been held confidential and in many quarters the opinion was expressed that the negotiations might extend over a period of several weeks.

Present

Among the firms whose approval of the proposals Mr. Whelpley expects are J. P. Morgan & Co., National City Co., J. Henry Schroeder & Co., N. M. Rothschild & Sons, and the Anglo-South American Bank, Ltd.

In addition, representatives of the Lautaro Nitrate Company, Ltd., a subsidiary of Cosach, and spokesmen for several banking firms in Holland and Switzerland, are represented.

Payment of the 1931 guarantee to the Chilean Government was arranged through the financing of a year ago, while the payments for 1932 and 1933 have been made in Cosach bonds.

It is proving difficult it is reported to divorce the political and strictly commercial angles in any consideration of the present difficulties or in attempting to arrive at a solution. Completed stocks in Chile are large and sufficient it is said for about two years based on present consumption. However complete shut-down of the works would aggrevate the present unemployment conditions in Chile and for this reason, it is reported from reliable sources, that a minimum amount of activity will be necessary at producing and shipping points.

Nitrogen Statistics

Statistical survey of world nitrogen production and consumption made in the report for the year 1930-31 of the British Sulphate of Ammonia Federation, Ltd. estimates that there was a decrease of 509,252 metric tons of nitrogen, or about 23 per cent, in the actual production of the forms of nitrogen enumerated below. The production in Chile decreased by 214,000 tons, or about 46 per cent, and output in other countries decreased by 295,252 tons. The total nitrogen-producing capacity in the world at the present time is estimated to be about 3,000,000 tons of nitrogen, exclusive of Chile. The total consumption decreased by 329,492 tons, or 17 per cent, following on increases for the years 1927-28, 1928-29, and 1929-30 of 25 per cent, 14 per cent, and 4 per cent respectively. The following figures are offered as fair estimates, but strict accuracy is not claimed for them. A few of the estimates appearing in previous reports have been revised.

World Production and Consumption of Pure Nitrogen for the Fertilizer Years
(In metric tons)

	1929-30	1930-31
Production—		
Sulphate of Ammonia—		
By-product	424,440	359,594
Synthetic	442,100	349,087
	866,540	708,681
Cyanamide	263,800	200,932
Nitrate of lime	130,500	110,585
Other forms of nitrogen*—		
Synthetic	427,300	393,150
By-product	51,400	30,940
Chile nitrate	464,000	250,000
Total production	2,203,540	1,694,288
Consumption—		
Manufactured nitrogen	1,586,904	1,377,005
Chile nitrate	363,893	244,300
Total consumption	1,950,797	1,621,305
Agricultural consumption about	1,750,000	1,455,000

*Including ammonia products used for industrial purposes and ammonia in mixed fertilizers.

Note.—Fertilizers are included in these tables under the final form as sold, so that, for example, cyanamide if converted into sulphate of ammonia is included under synthetic sulphate of ammonia, or, if into ammophos, is included under other synthetic nitrogen.

For 1925-26 total production was 1,333,700 tons (consumption, 1,258,500 tons); for 1926-27, 1,322,500 tons (1,366,335 tons); and for 1927-28, 1,724,000 (1,642,391 tons).

Cartel

The figures available show that the Convention de l'Industrie de l'Azote (C.I.A.), the European nitrogen cartel, had a beneficial effect in bringing world production in 1930-31 more nearly into line with consumption, instead of being enormously in excess as in the two previous fertilizer years. A further large increase in stocks was thus avoided. Strenuous efforts were made throughout the year under review to find a permanent basis for co-operation among the nitrogen producers of the world. But during the final negotiations which continued throughout June and July, 1931, and at which the Federation was represented by Mr. H. Smith, it unfortunately proved impossible to reconcile the claims to shares in the trade put forward by the various groups, notwithstanding the heavy sacrifices which the British and German synthetic groups had declared their readiness to make.

Highly Competitive

Since July, therefore, the nitrogen market has been the playground of unrestricted competition. Most European countries which are both producers and consumers have adopted protection in one form or another, and maintained a level of prices slightly lower than that of last season. In the free markets a fall in price of the order of 50 per cent has taken place. In normal circumstances such a fall would have greatly stimulated sales, but in the p esent world-wide crisis no very marked effect can be hoped for. In view of the financial strength of the groups concerned, the important part which nitrogen plays in military calculations, and the apparently general acceptance of the fashionable ideal of high protection, it would, comments the report, appear idle to expect an early termination to the struggle which is now in progress.

Statistics

The table below shows the excess of exports over imports of sulfate of ammonia during the last eleven calendar years, expressed in metric tons of nitrogen, for all countries having a surplus in any year.

The increase in the balance of exports from the European countries which have in recent years developed their synthetic ammonia capacities above the amount of their home demand is clearly shown.

Balance of Exports of Ammonium Sulfate
(In metric tons of nitrogen)
Balance of Exports from

Calendar Year	Great Britain and Ireland	United States (a)	Germany	Other European Countries (b)	British Empire Countries (c)	Total
1920	22,832	12,050	5,346	197	6,759	47,184
1921	26,163	20,498	2,385*	473	5,323	54,842
1922	29,862	29,804	2,433	1,532	3,930	67,571
1923	51,588	31,423	24,489	4,810	4,835	117,145
1924	54,764	23,518	21,323**	2,904	5,290	107,799
1925	51,736	20,800	100,903**	2,201	4,728	180,368
1926	30,252	34,680	138,057**	3,233	3,647	209,869
1927	52,405	25,438	137,770**	1,918	4,371	221,902
1928	78,824	10,663	172,426**	5,591	2,292	269,796
1929	120,381	26,310	149,680**	13,666	4,255	314,292
1930	111,757	10,021	86,298**	36,814	1,605	246,495

*May to December only.
**Including reparations deliveries.
(a) Not including exports from U. S. A., but including imports from other countries to the noncontiguous territories of Alaska, Hawaii, and Porto Rico.
(b) Poland, Belgium, Holland, Czechoslovakia, Italy, Sweden, Norway, Austria, Hungary, and Roumania.
(c) Canada, Australia, India, South Africa, and New Zealand.

National Aniline and Bureau of Internal Revenue have agreed for the corporation to receive a refund of $1,130,088 in income and profits taxes for the year 1918, the commissioner of Internal Revenue announced March 12.

This followed a suit in the Federal courts, which the corporation has agreed to dismiss.

The National Petroleum Company of Denver received an abatement of $1,656,992 for the year 1919 as a result of a decision of the Board of Tax Appeals.

Manufacturers of paradichlorbenzol disinfectants and deodorants have felt the need for making a block, which, when suspended in water would dissolve very slowly. After considerable research in the laboratories of Glyco Products found that if diglycol stearate, a non-alkaline soap, is incorporated in the block that the finished cake dissolves at a very slow rate when water drips on it or if it is suspended in water. The larger the percentage of diglycol stearate, the faster will the finished product disperse.

This sample principle can be applied to other products containing phenol, napthalene, pine tar, or other water insoluble solids.

Fats and Oils Data

The data for the factory production, factory consumption, imports, exports and factory and warehouse stocks of fats and oils and for the raw materials used in the production of vegetable oils for the three-month period ending Dec. 31, 1931 appear in the following statement:

Other vegetable oil foots	19,588	8,570	4,673
Other vegetable oil foots dist'l'd.	30	2,121	1,888
Acidulated soap stock	20,004	13,318	16,984
Miscl. soap stock	269	367	702

Raw Materials Used in the Manufacture of Vegetable Oils

Tons of 2,000 pounds

Kind	*Consumed Sept. 30 to Dec. 31*	*On hand Dec. 31*
Cottonseed	2,447,495	1,400,325
Peanuts, hulled	4,207	593
Peanuts, in the hull	1,377	229
Copra	53,860	25,106
Coconuts and skins	663	3
Corn germs	60,827	219
Palm kernels	5,465	231
Olives	575	43
Flaxseed	199,149	104,192
Castor beans	13,211	8,265
Mustard seed	209	1,301
Soybeans	38,803	64,786
Sesame	6,488	1,175
Other kinds	1,408	1,960

Imports of Foreign Fats and Oils, Quarter Ended December 31, 1931

Kind	*Pounds*
Animal oils & fats, edible	87,629
Whale oil	1,803,255
Cod oil	4,390,065
Cod-liver oil	3,511,252
Other fish oils	7,386,060
Tallow	1,139,846
Wool grease	1,065,311
Oleic Acid or Red oil	99,230
Stearic acid	1,738,186
Grease and oils, n.e.s. (value)	$9,224
Olive oil, edible	16,345,138
Peanut oil	2,136,660
Palm oil	57,234,982
Other edible vegetable oils	2,811,277
Tung oil	17,040,651
Coconut oil	72,541,052
Sulfur oil or olive foots	8,450,303
Other olive oil, inedible	2,027,264
Palm-kernel oil	3,820,761
Sesame oil	368
Cornauba wax	1,598,269
Other vegetable wax	659,877
Rape (colza) oil	2,563,020
Linseed oil	9,254
Soybean oil	732,088
Perilla oil	120,000
Other expressed oils	583,649
Glycerin, crude	2,351,659
Glycerin, refined	1,107,558

Exports of Domestic Fats and Oils, Quarter Ended December 31, 1931

Kind	*Pounds*
Oleo oil	12,452,789
Oleo stock	2,111,511
Tallow	190,394
Lard	144,349,223
Lard, neutral	2,481,129
Lard compounds, containing animal fats	448,963
Oleo stearin	1,538,002
Neat's-foot oil	283,364
Other animal oils, inedible	269,941
Fish oils	129,615
Grease stearin	978,446
Oleic acid, or red oil	233,743
Stearic acid	29,874
Other animal greases and fats	17,430,208
Cottonseed oil, crude	2,272,465
Cottonseed oil, refined	1,556,809
Coconut oil, crude	4,815,368
Coconut oil, refined	507,566
Corn oil	113,263
Soybean oil	672,124
Vegetable oil lard compounds	748,489
Other edible vegetable oils and fats	1,917,100
Linseed oil	172,072
Other expressed oils & fats, inedible	455,812
Vegetable soap stock	5,308,895
Glycerin	64,212

(1) The data of oils produced, consumed, and on hand by fish oil producers and fish canners were collected by the Bureau of Fisheries.

Advices from Washington state that Assistant Secretary Lowman of the Treasury has designated April 11 as the day for domestic ammonium sulfate producers to appear in Washington in connection with the anti-dumping charges against foreign sulfate. Curtis, Fosdick and Belknap are to represent producers. Importers will be heard at a later date.

Du Pont, dyestuffs division, announced Pontamine Diazo Blue 5GL. This dyestuff, when developed with beta naphthol, is greener and brighter than Pontamine Diazo Blue 3G and greener than Pontamine Diazo Blue BR. It is said to be used extensively for medium and light shades on cotton and rayon when a pure white discharge is desired. It is fast to light, for a diazo color, being superior in this respect, as well as in dischargeability, to Pontamine Diazo Blue 3G. It is further stated that Pontamine Diazo Blue 5GL is very soluble, levels and exhausts well, and may be applied with satisfactory results in all types of machines.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912

Of Chemical Markets, published monthly at Pittsfield, Mass., April 1, 1932.

State of New York, County of New York—ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Williams Haynes, who, having been duly sworn according to law, deposes and says that he is the Publisher of the Chemical Markets, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse side of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Williams Haynes, 25 Spruce St., New York, N. Y.; Editor, Williams Haynes, 25 Spruce St., New York, N. Y.; Managing Editor, W. J. Murphy, 25 Spruce St., New York, N. Y.; Business Manager, William F. George, 25 Spruce St., New York, N. Y.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Chemical Markets, Inc.; 25 Spruce St., New York, N. Y.; Williams Haynes, 25 Spruce St., New York, N. Y.; William F. George, 25 Spruce St., New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent. or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state). None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is (This information is required from daily publications only.)

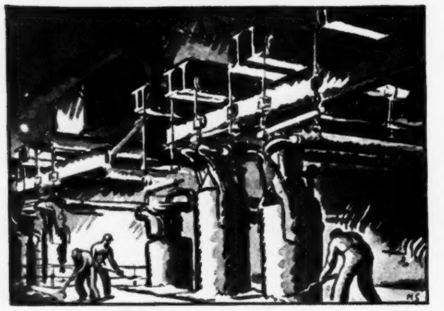
Williams Haynes, Publisher.

Sworn to and subscribed before me this 15th day of March, 1932. J. Oscar Fischer, Notary Public, N. Y. Co. Clerk's No. 90 N. Y. Reg. No. 27-434 Comm. Expires, March 1932.)

Statistics of Operation and Production in Chemical Industry*

Year and month	General operations: Employment F. R. B. Indexes: Adjusted	General operations: Employment F. R. B. Indexes: Unadjusted	General operations: Employment F. R. B. Indexes: Pay rolls, unadjusted	General operations: Stocks: Manufactured goods	General operations: Stocks: Raw materials	Ethyl alcohol (Production)	Explosives (Production)	Rosin, wood (Production)	Turpentine, wood (Production)	Superphosphates (Production)	By-product coke (Production)	Arsenic, refined (Production)	Fertilizer (Consumption)	Potash salts (Imports)	Nitrate of soda (Imports)
	Monthly average, 1923-1925=100					Thous. of gals.	Thous. of lbs.	Barrels		Thous. of short tons		Short tons	Thous. of short tons	Long tons	
1929: January	108.0	107.6	106.3	125.5	125.2	15,282	33,596	37,765	7,347	356	4,355	913	453	46,184	83,698
1930: January	111.1	110.6	109.3	136.7	118.4	11,601	31,986	40,954	7,510	459	4,167	742	525	85,188	89,421
1931:															
January	96.6	96.2	90.4	128.8	107.7	11,869	26,844	24,488	4,757	326	3,092	1,570	344	41,663	45,890
February	94.5	95.6	92.9	130.7	103.2	8,859	28,751	32,332	5,634	249	2,898	1,409	640	33,822	68,421
March	89.8	93.3	89.8	132.0	96.5	11,929	25,414	33,544	5,740	226	3,256	1,506	1,352	60,394	120,164
April	91.7	96.7	92.0	129.0	91.5	11,162	27,647	35,585	6,344	195	3,146	964	1,132	30,206	67,008
May	93.0	91.4	88.4	129.3	88.4	13,120	26,960	33,593	5,996	162	3,126	1,044	195	17,706	34,006
June	89.6	86.7	84.1	124.1	87.9	13,111	25,981	34,747	5,675	146	2,715	1,024	74	14,650	29,711
July	89.4	86.2	82.9	119.2	86.7	11,975	25,068	28,495	4,370	143	2,569	997	25	67,958	18,809
August	86.6	84.4	80.4	117.4	85.3	12,363	24,548	17,074	2,607	162	2,443	1,238	40	65,043	35,367
September	85.7	86.0	80.8	120.4	99.5	12,952	26,598	25,058	3,797	142	2,310	1,252	91	66,440	48,590
October	85.4	85.7	80.8	127.0	120.7	16,037	25,282	26,102	3,922	141	2,389	1,180	94	50,07[illegible]	33,968
November	83.1	83.5	76.4	131.9	133.9	14,084	24,509	21,440	3,547	143	2,276	1,126	66	12,872	29,871
December	81.9	82.0	75.0	126.9	119.3	14,002	18,595	23,242	3,733	188	2,234	1,172	67	11,998	17,029
1932:															
January	**81.9**	**81.7**	**71.4**	**129.6**	**118.1**	....	**18,175**	**23,196**	**3,626**	....	**2,101**	**857**	**172**	**16,268**	**30,114**

*Current Survey of Business



BETTER

.... BECAUSE AN ELECTRIC FURNACE IS IN THE BACKGROUND ....

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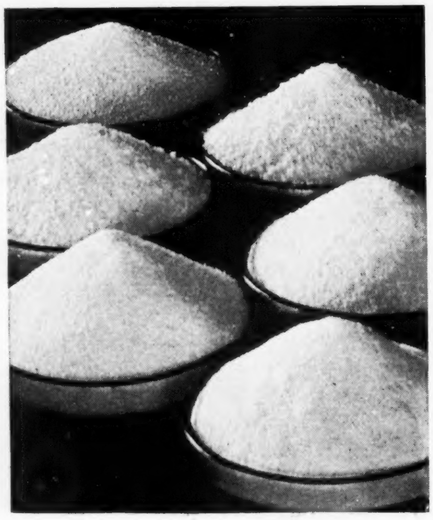

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PHOSPHORIC ACID 75%
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PHOSPHORIC ACID 50%
•
Sulphate free, low iron and other grades also available

AMMONIUM PHOSPHATES

MONO AMMONIUM PHOSPHATE
•
DI AMMONIUM PHOSPHATE

CALCIUM PHOSPHATES

MONO CALCIUM PHOSPHATE
•
TRI CALCIUM PHOSPHATE
•
CALCIUM PYRO PHOSPHATE

SODIUM PHOSPHATES

MONO SODIUM PHOSPHATE *Monohydrate*
•
MONO SODIUM PHOSPHATE *Anhydrous*
•
DI SODIUM PHOSPHATE *Crystalline*
•
DI SODIUM PHOSPHATE *Anhydrous*
•
TRI SODIUM PHOSPHATE *Crystalline*
•
TRI SODIUM PHOSPHATE *Globo*
•
TRI SODIUM PHOSPHATE *Monohydrate*
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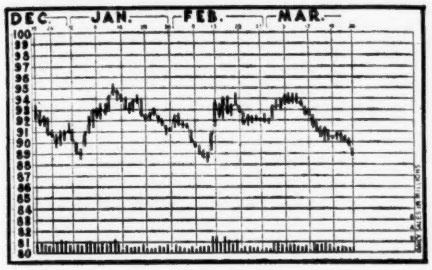
The Financial Markets

Stocks Sag to New Low as Tax Bill Is Debated—Reorganization Plan for International Combustion Announced—Ruhr Chemical Bonds Recalled—American Solvents Plan Declared Operative—Air Reduction Declares Regular Dividend—Monsanto 1931 Earnings Higher

"Whatever goes up must come down." This homely remark seems to apply with special significance to the gyrations of the stock market in the past fourteen months.



—*N. Y. Herald Tribune*

Any advance that is made, is not sustained for long. A month of increased levels is invariably followed by further liquidation and declines. February witnessed a modest advance, March saw not only this appreciation lost, but a new general low established for the past three years.

Legislation

Wall Street values suffered acutely at the hands of Washington legislators during the past month. After a week of higher prices carrying on the forward movement of February the market reacted to the uncertainty surrounding the tax problem and each succeeding week witnessed fresh declines.

March Depreciation

In a selected list of 240 stocks reported by the *N. Y. Times*, in twenty groups, a depreciation of $1,925,902,983 in values occurred in March, equal to 17 per cent, contrasted with an enhancement of $799,351,750 in February, or 7 per cent. Not only did the loss last month wipe out whatever appreciation there had been this year in prices, but it left stocks at a level at which they now are worth 81 per cent less than at the end of September, 1929.

The following table shows the percentage of decline in values for 240 issues, by groups, since the end of September, 1929:

NUMBER OF ISSUES

	Percentages
Amusements (5)	86
Building equipment (9)	85
Business equipment (4)	91
Chain stores (14)	67
Chemicals (9)	**80**
Coppers (15)	93
Department stores (10)	89
Foods (19)	72
Leathers (4)	89
Mail order (3)	89
Motors (15)	80
Motor equipment (7)	80
Oils (22)	78
Public utilities (29)	79
Railroads (25)	85
Railroad equipment (8)	89
Rubber (6)	85
Steels (13)	90
Sugars (9)	86
Tobaccos (14)	40

The market changes of the twenty groups are given in the following table showing the change in values and the average net change in points.

	March 1932	
Group and Number of Issues	*Avr. Net Ch'g in Points*	*Change in Values*
Amusements (5)	— 2.300	— $25,174,787
Building equip. (9)	— 1.917	— 30,767,201
Business equip. (4)	— 1.187	— 9,035,870
Chain stores (14)	— 1.098	— 37,528,331
Chemicals (9)	**— 3.083**	**— 151,445,913**
Coppers (15)	— 1.350	— 64,223,648
Dept. stores (10)	— 4.100	— 29,813,092
Foods (19)	— 1.829	— 98,914,945
Leathers (4)	— .312	— 234,950
Mail order (3)	— 2.042	— 29,005,225
Motors (15)	— 1.392	— 262,905,330
Motor equip. (7)	— 1.268	— 7,537,610
Oils (22)	— .068	— 38,436,326
Public utilities (29)	— 4.345	— 607,563,999
Railroads (25)	— 5.865	— 358,776,016
Railroad equip. (8)	— 1.922	— 29,224,810
Rubber (6)	— .917	— 7,728,574
Steels (13)	— 2.606	— 90,475,964
Sugars (9)	— .736	— 3,898,981
Tobaccos (14)	— 1.036	— 43,211,411
Avr. & tot. 240 issues	— 2.332	— $1,925,902,983

In sympathy with the general decline chemical stocks went into new low ground also. CHEMICAL MARKETS' Average Price declined on April 1 to $25.53 succeeding the week of February 5 ($25.95) as the low point. The price for the several Fridays of the month of March stood as follows: March 4, $30.39; March 11, $30.19; March 18, $28.41.

Dollar Loss

The actual dollar and cents loss of several of the leading chemical companies for the month of March were as follows:

Allied Chemical & Dye	$4,202,254
Commercial Solvents Corp	2,846,461
Davison Chemical Co	630,084
Du Pont de Nemours & Co	95,441,455
Mathieson Alkali Works	1,300,872
Texas Gulf Sulfur	9,208,950
Union Carbide & Carbon	35,732,933
U. S. Industrial Alcohol	1,962,681
Virginia-Carolina Chemical	120,223
Total	$151,445,913

Acquired

Atlas Powder Co. acquired entire assets of Peerless-Union Explosives. Atlas previously owned 49½ per cent. of the outstanding stock of Peerless-Union, which was incorporated in September, 1930, as the consolidation of Peerless Explosive Co., Union Explosive Co., and Black Diamond Powder Co., and began operations in October, 1930.

Reorganization

Reorganization committee of International Combustion announced that a plan of reorganization for International Combustion Tar & Chemical would shortly be submitted under the terms of which the creditors would receive in cash an amount estimated at approximately 50 per cent on their allowed claims. The plan is made possible by a cash offer of P. C. Reilly, of Indianapolis, Indiana, president, of the Republic Creosoting.

American Solvents common and $3 cumulative convertible preferences are recommended to be stricken from the list by the Committee on Stock List of the N. Y. Stock Exchange.

Price Trend of Chemical Company Stocks

	Feb. 27	*Mar. 4*	*Mar. 11*	*Mar. 18*	*Mar. 25*	*Net Change*
Allied Chem	76	83½	80¾	76¾	77	+1
Air Reduction	55	57½	58	55½	55⅛	+ ⅛
Anaconda	9⅜	10⅛	10	9	8½	— ⅞
Columbian Carbon	33⅞	35½	38¼	34⅞	33½	— ⅜
Com. Sol.	8⅝	9⅝	9⅛	8⅜	8	— ⅝
du Pont	54⅜	56¼	54⅜	49¼	48	—6⅜
Mathieson	15¾	18½	19½	17½	16½	+ ¾
Monsanto	24⅜	25½	27¾	27½	25	+ ⅝
Stand. N. J.	28¼	29¾	29⅞	29	28⅞	+ ⅝
Texas Gulf	24½	25½	24½	22¼	22	— ½
U. S. I.	27¾	28⅞	28½	26¾	26¾	—1

Over the Counter Prices

	Feb. 29, 1932 Bid	Feb. 29, 1932 Asked	Mar. 31, 1932 Bid	Mar. 31, 1932 Asked
J. T. Baker Chem.	9	13	9	13
Dixon Crucible	60	70	30	45
Merck pfd	54	59	55	59
Petroleum Derivatives	3	6	3	6
Solid Carbonic, Ltd.	3	4¾	2¾	4½
Tubize B	38	43	38	43
Worcester Salt	83	87	85	87
Young, J. S. Co., com.	87		83	
Young, J. S. Co., pfd	99		99	

Called

Dillon, Read & Co., as fiscal agent for Ruhr Chemical Corp., announced that $105,000 principal amount of the company's six per cent sinking fund mortgage bonds Series A, due in 1948, have been drawn for redemption on April 1, through the operation of the sinking fund.

Payment will be made at par at the office of Dillon, Read & Co., in New York. At option of the holder, principal and interest may also be collected in London in pounds sterling, in Amsterdam in Dutch guilders, or in Zurich in Swiss francs at the prevailing exchange rate on the day of presentation.

Effective

American Solvents & Chemical Corp. reorganization plan has been declared operative by the reorganization committee. Securities affected are American Solvents 6½ per cent. debentures, Rossville Commercial Alcohol 6 per cent. debentures, General Industrial 6½ per cent. debentures, and preference and common stock of American Solvents. More than 70 per cent of the debentures have been deposited.

Voted

Barnsdall Corp. officials announced that proxies representing 57 per cent. of the total outstanding shares have been received favoring the reduction in par value of the A and B capital stock and reclassification into one class of $5 par common, and the writing down of all of the company's oil and gas leases to $1.

Allied Chemical common stock owned by Sun Life Assurance of Canada was sold early in 1931. On Dec. 31, 1930, the company owned 26,755 shares of the stock, and a 5 per cent stock dividend paid on Jan. 2, 1931, lifted the total to 28, 092 shares.

This, it is understood, was the heaviest sale made last year by the insurance company, which is credited with being the largest corporate holder of common stocks in the world.

Monsanto Chemical Works officers and directors were reelected at the annual meeting. The company's by-laws were amended to authorize the holding of directors' meetings outside of the State of Missouri as well as within the state.

Dividends and Dates

Name	*Div.*	*Stock of record*	*Payable*
Abbott Laboratories	.62½	Mar. 18	Apr. 1
Air Reduction	.75	Mar. 31	Apr. 15
Allied Chem. & Dye Corp. pf	$1.75	Mar. 5	Apr. 1
Can. Celanese 7%	$1.75	Mar. 15	Mar. 31
Celanese Corp. of Am. 7%	$1.75	Mar. 23	Apr. 1
Colgate-Palmolive Peet	$1.50	Mar. 10	Apr. 1
Commercial Solvents	.15	Mar. 5	Mar. 31
Devoe & Raynolds com. A & B	.15	Mar. 21	Apr. 1
Devoe & Raynolds 1st pf.	$1.75	Mar. 21	Apr. 1
Devoe & Raynolds 2d pf.	$1.75	Mar. 21	Apr.
Du Pont	$1.50	Apr. 9	Apr. 25
Eastman Kodak	$1.25	Mar. 5	Apr. 1
Glidden Co. pr pf	$1.75	Mar. 18	Apr. 1
Hercules Powder	.75	Mar. 14	Mar. 25
Intl. Nickel	$1.75	Apr. 2	May 2
Intl. Salt	.50	Mar. 15	Apr. 1
Kellogg, Spencer	.15	Mar. 15	Mar. 31
Kellogg-Spencer	.15	June 15	June 30
Kappers Gas & Coke	$1.50	Mar. 11	Apr. 1
Lambert	$2.00	Mar. 17	Apr. 1
MacAndrews & Forbes	$1.50	Mar. 31	Apr. 15
MacAndrews & Forbes	.35	Mar. 31	Apr. 15
Mathieson Alkali	.50	Mar. 14	Apr. 1
Mathieson Alkali	$1.75	Mar. 14	Apr. 1
Monroe Chemical pf.	.87½	Mar. 12	Apr. 1
Monsanto Chemical	.31¼	Mar. 10	Apr. 1
National Carbon pf.	$2.00	Apr. 20	May 2
Natl. Dist. Prod.	.62½	Mar. 22	Apr. 1
Nat'l Lead	$1.25	Mar. 18	Mar. 31
Nat'l Lead pf B	$1.50	Apr. 22	May 2
Parke-Davis	.25	Mar. 19	Mar. 31
Parke-Davis	.10	Mar. 14	Mar. 31
Penna. Salt Mfg.	.75	Mar. 31	Apr. 15
Sherwin-Williams of Canada	$1.75	Mar. 15	Mar. 31
United Dyewood Corp	$1.75	Mar. 15	Apr. 1

Listed

N. Y. Stock Exchange authorized listing of 102,000 additional shares of common stock (no par value) on official notice of exchange by United Chemicals, Inc. for preferred stock of United Chemicals, Inc. on or before March 31, 1932; making the total amount applied for 284,692 shares.

The 102,000 shares are the property of United Chemicals, Inc., under restrictive agreement. The restrictive covenants affecting the shares have been effectively extinguished by releases executed by common stockholders for whose benefit the same were created.

United Chemicals, Inc., intends to offer its preferred stockholders the right to exchange their United Chemicals, Inc., preferred stock for common stock of Westvaco Chlorine Products Corp. (1 1-3 shares Westvaco com. stock for one share United Chemicals, Inc., pref. stock). Such offer may require the use of a part of 102,000 shares, the amount of which cannot be determined until such offer is accepted by preferred stockholders. Except as so required for such offer United Chemicals, Inc., intends to retain the shares for its general corporate purposes.

Foreign Markets

London	Feb. 29	March 31
British Celanese	8s 6d	7s 10½d
Celanese Corp	£1	£1
Courtaulds	£1¼	£1⅛
Distillers	44s 3d	47s
Imperial Chemical	15s 10½d	16s 1½d
Un. Molasses	7s 6d	8s 3d
Paris		
Kuhlmann	570frs	450frs
L'Air Liquide	1,100	850
Milan		
Montecatini	123 lire	118½ lire
Lina Viscosa	179	152½
Italgas	23	17½

Dividend Action

Air Reduction Co. declared regular quarterly dividend of 75 cents, payable April 15 to stock of record March 31.

At the annual meeting of stockholders, retiring directors were reelected, and at the subsequent organization meeting officers were reelected.

Allied Chemical declared regular quarterly dividend of $1.50 on common stock, payable May 2 to stock of record April 15.

Spencer Kellogg & Sons, Inc., declared two quarterly dividends of 15 cents each for the two remaining quarters of the fiscal year which ends August 30.

This represents a reduction of five cents a share from the 20 cents a share paid in the first and second quarters and brings total disbursements to stockholders for the year to 70 cents a share compared with 80 cents paid last year.

Canadian Industries directors declared extra dividend of 25 cents per share in addition to the regular quarterly dividend of 62½ cents per share on the common stock, both payable April 30 to holders of record March 31. An extra dividend of 25 cents per share was paid on this issue on April 30 and on Oct. 31, 1931, one of 50 cents per share on July 31, 1931, and one of $1.25 per share on Jan. 31, 1931.

Wilbur White Chemical filed a certificate in the office of the Secretary of State changing its capital from $350,000 in $100 shares to 3,500 shares of no par value.

Carleton H. Palmer, president of E. R. Squibb elected a director of the Long Island Railroad.

Earnings

Several companies despite generally poorer conditions existing in 1931 when compared with 1930 showed better earnings last year. Those in the chemical and allied fields are listed below:

Company	*1931 Net*	*1930 Net*	*1931 Net per sh.*	*1930 Net per sh.*
Affil. Prod., Inc.	1,010,088	771,404	2.63	2.01
Hachmeister-L. Co.	244,686	103,126	1.38	p4.73
Monsanto Chemical Co.	1,280,782	732,684	2.98	1.73
Monroe Chemical Co.	255,552	240,465	1.21	1.09
Nat. Distil. Prod.	m372,328	m307,286	....	....
National Oil Products Co.	245,629	223,599	7.17	6.36

mBefore Federal Taxes.
pOn preferred stock.

Earnings at a Glance

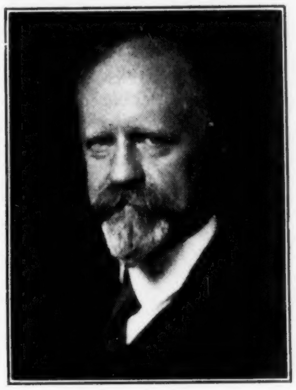
Company	Annual Dividends	Net Income 1931	Net Income 1930	Common Share Earnings 1931	Common Share Earnings 1930
Allied Chem. & Dye: Year, Dec. 31	$6.00	$18,913,510	$25,103,539	h$6.74	h$9.77
Alum. Indus., Inc.: Year, Dec. 31	$1.00	$134,142	$185,732	$1.34	$1.86
Amer. Cyanamid: 18 mos., Dec. 31	f....	$520,803	......	c$ .21	....
Amer. Smelting & Refining Co.: Year, Dec. 31	w...	874,976	11,098,751	m1.75	3.77
Barnsdall Corp: Year, Dec. 31	f....	†3,268,637	5,130,890	...	c2.27
Corn. Prod. Refining: Year, Dec. 30	§3.00	10,709,775	14,067,689	3.54	4.86
Columbian Carbon: Year, Dec. 31	3.00	1,628,793	2,514,923	h3.02	h5.04
International Nickel: Dec. 31 quarter	f ...	1,088,640	1,872,225	.04	.09
Year, Dec. 31	f ...	5,094,497	11,770,060	.22	.67
Monsanto Chem. Wks.: Year, Dec. 31	1.25	1,280,782	732,684	h2.98	h1.73
Union Carbide & Carbon: Year, D c. 31	2.00	18,029,522	28,041,425	2.00	3.12
Vanadium Corp.: Year, Dec. 31	f ...	†1,096,721	1,116,983	...	3.04

†Net loss. dDeficit. fNo common dividend. hOn shares outstanding at close of respective periods. §Plus extras. cOn combined Class A and Class B shares.

Company Reports

Cyanamid Reports Profit

American Cyanamid and subsidiaries for 18 months ended Dec. 31, 1931, shows consolidated net profit of $520,803 after depreciation, depletion, interest, federal taxes, minority interest, etc., equivalent to 21 cents a share on combined 2,470,159 no-par shares of Class A and B common stock outstanding at end of period, including shares reserved for stocks not yet presented for exchange. Previous report of company was for 12 months ended June 30, 1931, showing consolidated net profit of $548,669, equal to 22 cents a share on combined Class A and B common stocks, including shares reserved for stocks to be presented for exchange. Company has changed its fiscal year to end Dec. 31, instead of June 30.



William B. Bell

Current assets as of Dec. 31, 1931, including $5,452,137 cash marketable securities, amounted to $16,975,210 and current liabilities were $2,490,421. This compares with cash and marketable securities of $5,608,088, current assets of $19,040,953 and current liabilities of $2,765,959 on June 30, 1931.

Consolidated income account for 18 months ended Dec. 31, 1931, compares as fo!lows:

	18 mos. end. Dec. 31, '31	12 mos. end June 30, '31	12 mos. end. June 30, '30
Operating profit	$4,338,810	$2,969,325	$7,513,517
Divs, int. and disc	523,801	376,861	719,642
Royalties, licenses, etc	286,186	265,502	355,341
Other income (net)	288,168	182,233	254,633
Total income	$5,436,965	$3,793,921	$8,843,133
Depreciation and depl	2,262,805	1,529,512	2,636,327
Research, process and mark dev. exp	1,998,629	1,265,250	879,715
Interest	520,994	363,790	438,216
Federal taxes	5,036	1,293	185,135
Min. interest	128,698	85,407	85,641
Net profit	$520,803	$548,669	$4,618,099
Preferred dividends	......	......	3,141
Common dividends	......	......	3,569,527
Surplus	$520,803	$548,669	$1,045,431

Allied Chemical Nets $6.74 a Share

Allied Chemical and subsidiaries for year ended Dec. 31, 1931, shows net income of $18,931,510 after depreciation, federal taxes, etc., equivalent after 7 per cent. preferred dividends, to $6.74 a share on 2,401,288 no-par shares of common stock outstanding at end of year. This compares with $25,103,539 or $9.77 a share on 2,286,980 common shares in 1930.

Surplus after dividends in 1931 was $1,607,332 against $8,472,070 in previous year.

Current assets as of Dec. 31, 1931, were $152,407,823 and current liabilities, including tax reserves, were $9,340,307, comparing with $155,451,336 and $12,072,167, respectively, on Dec. 31, 1930. Cash, U. S. Government and other marketable securities amounted to $114,651,067, against $113,320,485 at end of previous year.

Consolidated income account for year 1931 compares as follows:

	1931	1930	1929	1928
*Gross inc	$20,779,031	$27,886,685	$33,384,552	$29,871,001
Fed tax	1,847,521	2,783,146	3,186,029	2,908,560
Net inc	$18,931,510	$25,103,539	$30,198,523	$26,962,441
Pfd divs	2,749,943	2,749,943	2,749,943	2,749,943
Com divs	14,574,235	13,881,526	13,068,654	13,068,654
Surplus	$1,607,332	$8,472,070	$14,379,926	$11,143,844
Prev surp	204,133,460	196,205,745	181,825,819	170,681,975
Total sur	$205,740,792	$204,677,815	$196,205,745	$181,825,819
Stk divs	571,540	544,355	......	......
Tr to cont res	40,000,000	......	......	......
P & L sur	$165,169,252	$204,133,460	$196,205,745	$181,825,819

*After expenses, depreciation, ordinary taxes, etc.

Consolidated balance sheet as of Dec. 31, 1931, compares as follows:

Assets

	1931	1930	1929	1928
R E, plts, eq, mines, etc	$223,068,894	$219,136,152	$202,315,812	$196,699,901
Investments	10,413,770	5,250,453	5,469,076	7,377,332
Cash	20,012,912	20,337,616	20,303,291	15,097,408
Gov & mark secur	94,638,155	92,982,868	92,500,723	82,710,581
Accts & notes rec	11,188,465	13,397,157	16,225,955	16,864,353
Inventories	26,568,292	28,733,695	28,746,078	25,771,227
Def chgs	853,372	1,090,645	746,643	790,052
Pats, gdwl, etc	21,305,942	21,305,942	21,305,942	21,305,942
Total	$408,049,802	$402,234,528	$387,613,520	$366,616,796

Liabilities

	1931	1930	1929	1928
Pfd stock	$39,284,900	$39,284,900	$39,284,900	$39,284,900
Com stock	*12,006,440	11,434,900	10,890,545	10,890,545
Divs pay	4,289,418	4,117,955	3,954,649	3,954,649
Accts pay	2,541,674	4,270,637	5,148,793	5,594,421
Accrd wages	163,449	326,463	417,282	401,720
Depr res, etc	122,746,940	117,158,292	110,466,603	104,374,095
Gen con res	54,731,268	13,297,384	12,877,610	12,340,439
Tax res	2,345,766	3,357,110	3,753,478	3,341,681
Ins res	2,303,470	2,325,928	2,310,951	2,224,894
Other res	2,467,225	2,527,499	2,302,964	2,383,634
Surplus	165,169,252	204,133,460	196,205,745	181,825,818
Total	$408,049,802	$402,234,528	$387,613,520	$366,616,796

*Represented by 2,401,288 no-par shares carried at $5 per share.

"With a realization that the world-wide economic readjustment now being experienced may be attended by a continuance of the disturbed business conditions," commented Orlando F. Weber, president, "it has been deemed advisable to transfer $40,000,000 from surplus to contingency reserves for the purposes of amply protecting the company's operations and assets against future contingencies."

Preliminary statement of McKesson & Robbins, Inc., (drug manufacturers) for year ended December 31, 1931, shows net profit of $1,757,882, after depreciation, interest, federal taxes, etc., equivalent after preferred dividends to 24 cents a share on 1,074,734 no-par shares of common stock. This compares with net profit of $2,629,196, or 96 cents a share on 1,074,721 common shares in 1930.

Net sales for 1931 totaled $119,967,384 as compared with $134,865,440 in 1930.

Current assets as of December 31, last, totaled $54,009,599 against current liabilities of $10,724,421. Cash on hand was $2,847,494 and notes payable to banks amounted to $1,900,000.

McKesson & Robbins, Inc., has taken no action on the quarterly dividend of 87½ cents on the preferred stock, due at this time.

Monsanto Shows Larger Profits in 1931

Monsanto Chemical and subsidiaries for year ended Dec. 31, 1931, shows net profit of $1,280,782 after depreciation, interest, federal taxes, etc., equivalent to $2.98 a share on 429,000 no-par shares outstanding at close of year. This compares with $732,684, or $1.73 a share, on 422,600 shares in 1930.

Edgar M. Queeny

Current assets as of Dec. 31, 1931, including $2,206,112 cash and marketable securities, amounted to $5,895,505 and current liabilities were $940,254. This compares with cash and marketable securities of $2,080,830, current assets of $6,470,676 and current liabilities of $1,031,727 at close of preceding year.

Capital surplus account follows: Capital surplus Dec. 31, 1930, $3,405,969; add: Premium on purchases and sales of treasury stock (net) $2,564; transfer of reserves for relocations, changeovers and extensions $1,447,576; total $4,856,109; deduct: net book value of properties abandoned and charged off, as a result of plant relocations and changeovers $731,866; capital surplus Dec. 31, 1931, $4,124,243.

Earned surplus account follows: earned surplus Dec. 31, 1930, $2,141,801; add: net profit for year 1931, $1,280,782; total $3,422,583; deduct: loss in dollar value of net current assets of British subsidiary as at Sept. 19, 1931, $234,298; cash dividends paid $535,273; earned surplus Dec. 31, 1931, $2,653,012.

Consolidated income account for year 1931 compares as follows:

	1931	*1930*	*1929*
Gross profit	$4,286,362	$3,677,771	$4,725,881
Expenses	1,355,072	1,484,595	1,584,970
Oper profit	$2,931,290	$2,193,176	$3,140,911
Other income	168,364	199,875	171,812
Total income	$3,099,654	$2,393,051	$3,312,723
Depr and obsol	977,008	947,616	815,537
Research	463,956	453,148	424,847
Interest	108,529	112,829	143,616
Federal taxes, etc	171,929	105,076	229,804
Other deduct	97,450	41,698	7,581
Net profit	$1,280,782	$732,684	$1,691,338
Cash dividends	535,273	515,561	382,938
Surplus	$745,509	$217,123	$1,308,400

Vanadium Loss $1,096,721

Vanadium and subsidiaries for year ended Dec. 31, 1931, shows net loss of $1,096,721 after depreciation, interest, inventory adjustments, etc. This compares with net profit of $1,116,983, equal to $3.04 a share on 366,637 no-par shares of capital stock in 1930, excluding stock in treasury and based on issued shares of stock, including treasury shares outstanding at close of year, 1930 net profit was equal to $2.95 a share on 378,367 shares.

Consolidated income account for year 1931 compares as follows:

	1931	*1930*	*1929*	*1928*
Net sales	$2,347,589	......	......	......
Cost & exp	2,893,294	......	......	......
Oper loss	$545,705	*$981,287	*$2,328,830	*$1,976,165
Other income	119,721	†697,091	344,561	216,794
Loss	$425,984	*$1,678,378	*$2,673,391	$2,192,959
Depr & depl	328,604	512,202	608,448	251,305
Fed tax	......	49,193	207,630	228,704
Interest, etc	192,133	......	......	......
Other chgs	......	......	7,427	6,926
Invent adj	150,000	......	......	......
Net loss	$1,098,721	*$1,116,983	*$1,849,886	*$1,706,024
Dividends	274,977	1,088,586	1,468,648	1,506,548
Deficit	$1,371,698	‡$28,397	‡$381,238	‡$199,476

*Profit. †Includes profit on resale of company's own stock. ‡Surplus.

Columbian Carbon Earns $1,628,793

Columbian Carbon and subsidiaries for year ended Dec. 31, 1931, shows net profit of $1,628,793 after depreciation, depletion, federal taxes, minority interest, etc., equivalent to $3.02 a share on 538,420 no-par shares of capital stock. This compares with $2,514,923 or $5.04 a share on 498,505 shares in 1930.

"While Columbian Carbon has not escaped the effects of the depression," says F. F. Curtze, president, in annual report, "drastic and far reaching economies have been instituted which will be reflected in a material reduction of operating costs in 1932."

Total open flow capacity of the company's wells on Dec. 31, 1931, exceeded 2,000,000,000 cubic feet of gas daily. During year a contract was concluded for sale of substantial volume of gas from wells in eastern Kentucky to a subsidiary of Columbia Gas & Electric. Deliveries under this contract are now running at the rate of about 3,000,000 cubic feet per day, but it is expected they will be materially increased before the end of the present year, the company says.

The following tabulation shows the chief activities of the company in the past few years:

Production	*1931*	*1930*	*1929*
Carbon black (lbs.)	76,804,622	100,133,415	104,855,183
Special blacks, inks and other products (lbs.)	22,009,345	14,012,439	17,487,437
Gasoline (gallons)	37,815,789	45,398,121	26,179,539
Nat. gas (cubic feet)	*39,011,853	*47,376,015	*47,831,160

*Last three ciphers omitted.

Company's sales of natural gas last year amounted to 27,955,406,000 cubic feet, yielding $2,340,355 gross revenue, against 31,136,513 cubic feet in 1930 for $2,689,329, and 26,934,903,000 cubic feet in 1929 for $2,545,999.

The natural gas pipe line from Panhandle, Texas to Chicago in which the company has an interest, was placed in service late last year.

Consolidated income account for year 1931 compares as follows:

	1931	*1930*	*1929*	*1928*
Net sales	$9,474,216	$9,756,328	$12,659,484	$10,652,871
Cost of sales	4,893,724	4,308,889	4,799,524	4,354,221
Depr & depl	1,526,203	1,424,396	1,840,695	1,457,956
Expenses	1,701,758	1,313,524	1,686,170	1,348,842
Oper profit	$1,352,531	$2,709,519	$4,333,095	$3,491,852
Other income	508,032	452,306	353,444	148,479
Total income	$1,860,563	$3,161,825	$4,686,539	$3,640,331
Other charges	162,297	169,840	246,223	273,969
Minority int	†30,528	‡237,062	‡349,825	‡164,067
Federal tax	100,000	240,000	425,000	375,000
Net profit	$1,628,794	$2,514,923	$3,665,491	$2,827,295
Dividends	2,614,494	2,936,166	2,286,720	1,608,464
Deficit	$985,700	$421,243	*$1,378,771	*$1,218,831

*Surplus. †Credit. ‡Debit..

Koppers Earnings Decline Slightly

Koppers Gas & Coke and subsidiaries report for year ended Dec. 31, 1931, consolidated net profit of $2,458,187 after depreciation, depletion, federal taxes, interest and amortization and minority interest, equivalent to $12.29 a share on 200,000 shares of 6% preferred stock. This compares with $3,140,113 before depletion, or $15.70 a share on preferred in 1930. The entire issue of 807,091 shares of common is owned by Koppers Co. of Delaware.

Consolidated income account for year 1931 compares as follows:

	1931	*1930*	*1929*	*1928*
Net from oper	$5,647,259	$4,430,785	....	....
Other income	3,670,077	4,737,075	....	....
Gro income	$9,317,336	$9,167,860	$11,078,853	$6,441,656
Depr & depl	2,053,526	*1,134,560	*854,781	*519,776
Federal tax	160,159	446,568	779,710	673,157
Interest	3,012,982	3,315,276	1,881,256	1,341,261
Other deduct	1,632,482	1,131,343	963,040	111,588
Net profit	$2,458,187	$3,140,113	$6,600,066	$3,795,874
Pfd divs	1,200,000	1,200,000	1,200,000	1,800,000
Surplus	$1,258,187	$1,940,113	$5,400,066	$1,995,874

*Depreciation only.

Carbide Reports Lower Earnings

Union Carbide & Carbon and subsidiaries for year ended Dec. 31, 1931, shows net income of $18,029,522 after federal taxes, depreciation, depletion, interest and subsidiary preferred dividends, equivalent to $2 a share on 9,000,743 no-par shares of stock. This compares with $28,041,425 or $3.12 a share in 1930.

Consolidated income account for year 1931 compares as follows:

	1931	*1930*	*1929*	*1928*
Net aft fed tax	$26,076,680	$37,002,705	$44,126,066	$39,527,253
Depr. depl, etc.	6,786,708	7,812,932	7,461,240	7,694,857
Balance	$19,289,972	$29,189,773	$36,664,826	$31,832,396
Interest	723,772	611,670	674,802	692,014
Sub pf div	536,678	536,678	563,000	563,000
Net inc	$18,029,522	$28,041,425	$35,427,024	$30,577,382
Dividends	23,401,932	23,395,734	20,736,657	16,235,208
Deficit	$5,372,410	*4,645,691	*14,690,367	*14,342,174
P & L surp.	43,659,274	98,579,703	96,781,281	86,606,035

*Surplus.

Surplus account follows: Surplus Jan. 1, 1931, $98,579,703; deduct: Deficit after dividends for year 1931, $5,372,410; adjustment of fixed asset values $39,794,031; adjustment of power contracts $1,602,621; adjustment of marketable securities to market Dec. 31, 1931, $3,507,200; adjustment on account of decline in foreign exchange $3,455,838; miscellaneous items $1,188,329; surplus Dec. 31, 1931, $43,659,274.

In remarks to stockholders, J. J. Ricks, president, says in part: "Current assets totaled $81,784,972, including $14,311,603 cash and $11,341,265 marketable securities. Market value of the securities was $3,507,199 lower than at the close of the previous year, which amount has been written off and charged to surplus. An additional surplus charge of $3,455,838 was made to provide for depreciation in exchange value of current assets of foreign subsidiaries. There also was charged to surplus $1,602,621 paid for unused electrical power.

"Current liabilities total $11,797,174, making working capital $69,987,797. During the year 1931, $17,059,346 was spent on property improvements comprising construction of hydro-electric power plant and steam power plant in West Virginia; an industrial plant at Alloy, W. Va.; additional hydro-electric and plant capacity in Norway; construction of butanol plant in West Virginia; enlargement of methanol plant at Niagara Falls, N. Y.; construction of Vinylite plant at South Charleston, W. Va.; purchase of all outstanding stock of Societa Anonima Elettrografite di Forno Allione (Electrode Plant)."

The number of stockholders has increased to 49,369 against 38,404 a year ago and 28,780 in 1929.

Heyden Makes Favorable Showing

Heyden Chemical for year ended Dec. 31, 1931, shows net profit of $243,227 after interest, federal taxes, etc., equivalent after 7 per cent. preferred dividend requirements, to $1.47 a share (par $10) on 150,000 shares of common stock. This compares with $302,402 or $1.87 a common share in 1930.

Foreign Financial Statements

Canadian Industries, Ltd. for 1931 shows a total income of $3,433,540, as compared with $3,712,034 for the previous year. After the payment of preferred dividends of $325,500, and common dividends of $3,005,487, there remained a surplus of $102,553. Previous surplus adjusted for 1930 taxation was brought forward at $12,326,368, making a total of $12,428,921. Of this the company set aside $1,200,000, as an extraordinary reserve, to cover any depreciation in the securities held by them. The surplus brought forward being $11,228,921.

Imperial Chemical Industries, in a preliminary statement for the year ended Dec. 31, 1931, shows gross profit of £4,668,685, comparing with £5,129,757 in 1930. After allocating £1,000,000 to obsolescence reserve and providing £260,395 for income tax as against £500,000 and £156,365, respectively, in 1930, net profit was £3,408,290, against £4,473,392 in preceding year.

Imperial Chemical Industries declared a final common dividend for 1931 of 3 per cent., less tax, making 4½ per cent. for the entire year.

Newport Industries Has Net Loss

Newport Industries, Inc. and subsidiaries for first three months of operation ended Dec. 31, 1931, shows net loss of $123,706 after taxes, depreciation, interest and other charges but exclusive of idle plant expenses, aggregating $25,528 for period which were charged to the contingencies reserve provided for this purpose at the inception of the company.

Statement for the year ended Dec. 31, 1931, (including results for the period Jan. 1 to Sept. 30, 1931, of the business acquired by Newport Industries, Inc., on Sept. 30, 1931), shows net loss of $423,475 after taxes, depreciation, interest and other charges including $57,662, write-down on inventories, but exclusive of a total charge for the year of $92,358 for idle plant expense.

Consolidated income account of Newport Industries, Inc., for first three months of company's operation ended Dec. 31, 1931, and of the business acquired by the company for the preceding nine months' period, together with the combined results for year 1931, follows:

	3 months Dec. 31, '31	*9 months Sept. 30, '31*	*Year Dec. 31, '31*
Sales, net	$429,235	$1,703,002	$2,132,237
Cost and expenses	522,065	1,835,033	2,357,098
Loss	$92,830	$132,031	$224,861
Depreciation	52,331	155,840	208,171
Int. & other chgs., net	11,762	11,898	23,660
Loss	$156,923	$299,769	$456,692
Profit from sale of stk	15,885	......	15,885
Dividends	17,332	......	17,332
*Net loss	$123,706	$299,769	$423,475

*Exclusive of idle plant expenses of $25,528 for December quarter, $66,830 for the nine months ended September 30, making a total for the year of $92,358.

Merck's Net Profit $273,512

Merck for year ended Dec. 31, 1931, shows net profit of $273,512 after expenses and taxes, equivalent to $8.05 a share (par $100) on 33,950 issued shares of 8 per cent. preferred stock on which unpaid cumulative dividends amounted to 34 per cent. at close of year. Allowing for only regular annual dividend requirements on the 8 per cent. preferred stock, balance is equal to 10 cents a share on 40,000 no-par shares of common stock. This compares with $271,585 or $8 a share on preferred stock in 1930.

Net profit of Merck & Co., Inc., and subsidiaries (controlled by Merck Corp.) for year ended Dec. 31, 1931, was $408,119 after depreciation, interest, amortization and federal taxes, equal to $4.08 a share on 100,000 shares of no-par stock. A provision of $27,772 for decline in Canadian exchange was charged direct to surplus account. This compares with $426,206 or $4.26 a share in 1930.

International Nickel and subsidiaries for year ended Dec. 31, 1931, shows net profit of $5,094,497 after interest, federal taxes, depreciation, depletion, etc., equivalent after 7 per cent. preferred dividends, to 22 cents a share on 14,584,025 no-par shares of common stock outstanding at close of year. This compares with $11,770,060, or 67 cents a share on common in 1930.

Net profit for quarter ended Dec. 31, 1931, was $1,088,640 after charges and taxes, equal to 4 cents a share on common, comparing with $645,970, or 1 cent a share in preceding quarter and $1,872,225, or 9 cents a share in December quarter of 1930.

American Commercial Alcohol Reports Loss

American Commercial Alcohol and subsidiaries for year ended Dec. 31, 1931, shows loss of $597,651 after charges and depreciation. Report states that against the reserves of $1,098,201 there has been charged $711,115 consisting of a $445,326 reduction in inventory values, $72,670 amortization of organization expenses, miscellaneous items amounted to $36,484 and $156,636 for obsolescence and extraordinary depreciation. For year ended Dec. 31, 1930, company reported net loss of $478,022 after expenses, depreciation and after deducting $534,403 provision for reduction of inventories to market values.

The Industry's Stocks

NEW YORK STOCK EXCHANGE

1932 Mar. Last	1932 Mar. High	1932 Mar. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Mar.	During 1932	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1931	1930
50¾	62½	50⅛	62½	46	109⅞	47⅝	89,000	202,100	Air Reduction	No	830,000	$3.00	4.54	6.32
74⅛	87½	73⅛	87½	62¼	182¾	64	386,600	1,144,900	Allied Chem. & Dye	No	2,401,000	6.00		9.77
117½	119	116¾	119	108	133½	100	1,100	4,000	7% cum. pfd.	100	393,000	7.00		
5⅛	6¾	5½	7½	5¼	29¾	5⅛	2,400	6,500	Amer. Agric. Chem.	100	333,000		Yr. Je. '30	Nil
9⅝	11	8½	11	6½	14⅞	5	146,100	219,500	Amer. Com. Alc.	No	389,000			d1.27
44⅝	51⅞	43⅛	51⅞	41⅞			18,100	48,535	American Home Products	No	611,000	.35		
10½	16¾	10¼	18⅝	10¼	58⅛	17½	59,700	206,900	Amer. Smelt. & Refin.	No	1,830,000	4.00		3.77
57	73¼	55	85	55	138½	75	4,100	7,000	7% cum. pfd.	100	500,000	7.00		
⅛	¼	⅛	½	⅛	4½	¼	23,100	76,200	Amer. Solvents & Chem.	No	503,000			d2.86
9¾	11¾	9¾	12	9½	18	10⅜	3,100	8,600	Archer Dan. Midland	No	550,000	2.00	Yr. Aug. 30	1.68
¾	1⅛	⅝	1⅛	½			32,200	97,200	Armour & Co.	No	50,000,000			
16	21	16	25½	16	54	18	1,200	6,900	Atlas Powder Co.	No	265,000	4.00	.59	2.67
72	75	72	79½	72	99⅞	77¼	340	1,210	6% cum. pfd.	100	96,000	6.00		
3⅜	5	3⅝	5	3			4,200	18,900	Celanese Corp. of America	No	1,000,000			
2⅜	3⅜	2¼	3⅜	2¼	7¼	2¼	4,100	6,400	Certain-Teed Products	No	400,000			d7.61
11	12	11	15½	11	25⅛	8¼	300	700	7% cum. pfd.	100	63,000			
27¼	31½	24¾	31½	24¾	50½	24	14,300	27,300	Colgate-Palmolive-Peet	No	2,000,000	2.50		3.76
29¾	41⅞	29⅝	41⅞	28	111⅝	32	108,000	197,400	Columbian Carbon	No	499,000	5.00		5.04
7⅝	10¼	7⅝	10¼	7¼	21½	6⅝	156,500	382,600	Comm. Solvents	No	2,530,000	1.00	.83	1.07
41	47⅜	40⅝	47⅜	37	86⅝	36¼	52,300	167,400	Corn Products	25	2,530,000	3.00		4.82
126	127	125	129½	125	152¼	116	970	1,650	7% cum. pfd.	100	250,000	7.00		
3	5	3	5¼	3	23	3¼	8,500	25,100	Davison Chem. Co.	No	504,000		Yr. Je. '30	4.00
13¼	...	...	13¼	10¼	19⅛	8½		800	Devoe & Raynolds "A"	No	160,000	1.20		2.24
85	85	85	95	85	109	100	100	110	7% cum. 1st pfd.	100	16,000	7.00		
48	55⅜	47½	57	47½			142,700	373,500	Drug, Inc.	No	3,501,000	1.00		
45⅜	58⅜	45⅛	59¾	45⅛	107	50⅜	398,900	1,772,800	DuPont de Nemours	20	11,014,000	4.00	4.29	4.52
...	105	101½	105	99¼	185¾	91½	2,800	11,000	6% cum. deb.	100	978,000	6.00		
73	84¾	72½	87⅞	68½	185¾	77	84,300	201,500	Eastman Kodak	No	2,261,000	5.00		8.84
110	112	110	118	99	135	103	160	390	6% cum. pfd.	100	62,000	6.00		
16⅝	19⅜	16⅝	19½	15¼	43¼	13¼	30,000	98,800	Freeport Texas Co.	No	730,000	4.00	3.26	w4.77
5½	7	5¼	7	4¾	16⅛	4½	11,800	20,300	Glidden Co.	No	695,000		Yr. Oct. '30	Nil
48¼	50	48¼	54	42	80	40	140	200	7% cum. prior pref.	100	74,000	7.00	Yr. Oct. '30	Nil
20	26½	20	28⅛	20	43¼	13¼	1,400	3,600	Hercules Powder Co.	No	603,000	3.00	1.04	2.61
90	94¾	90	94¾	90	119½	95	260	1,040	7% cum. pfd.	100	114,000	7.00		
26	38⅜	26	38⅜	23⅛	86	21	51,100	104,600	Industrial Rayon	No	200,000	4.00		7.74
½	1	½	1½	½	5¼	1	3,600	7,200	Intern. Agric.	No	450,000		Yr. Je.'30	1.68
...	...	...	7⅛	4⅝	51¼	4½		2,400	7% cum. prior pfd.	100	100,000	7.00	Yr. Je. '30	14.58
1	1½	⅞	1⅞	⅝			16,900	66,600	Intern. Combustion	No	1,049,513			
7½	9¼	7¼	9¼	7⅛	20⅛	7	241,500	658,300	Intern. Nickel	No	14,584,000	1.00		.67
17½	23⅛	17½	23½	17½	42	18	10,700	22,400	Intern. Salt	No	240,000	3.00		
9⅞	9⅞	9½	10	9½	16½	9	600	1,700	Kellogg (Spencer)	No	598,000	0.80		h1.14
¾	8⅛	½	9⅛	½			1,923,000	3,040,900	Kreuger & Toll					
42¾	54¾	42	56¾	42			104,900	210,600	Lambert	No	748,996	8.00		
20	24¼	20	24¼	19⅝			23,000	41,200	Lehn & Fink	No	419,166	3.00		
18	22	17	22	14½	55⅛	13⅜	14,400	27,500	Liquid Carbonic Corp.	No	342,000	4.00	2.96	5.22
3¼	4⅜	3	5½	3	17	3⅜	22,600	40,100	McKesson & Robbins	No	1,073,000	1.00		.96
8¾	22	8¾	23	8¾	37⅝	16	10,400	11,180	conv. 7% cum. pref.	50	428,180	3.50		
13	14½	13	15¼	13	25	13	1,400	2,000	MacAndrews & Forbes	No	340,000	2.60		2.61
15	20⅞	15	20⅞	13¼	31½	12	12,600	25,400	Mathieson Alkali	No	650,000	2.00	1.88	2.96
...	...	...	118	100⅛	125⅜	106½		640	7% cum. pfd.	100	28,000	7.00		
23½	30¾	23¼	30¾	20¾	29	16¼	20,000	35,900	Monsanto Chem.	No	416,000	1.25		1.71
18¾	24½	18¾	24½	17¼	36⅜	16	28,700	69,100	National Dist. Prod.	No	252,000	2.00	—	1.23
82½	92	82½	92	82½	132	78½	1,000	3,000	National Lead	100	310,000	5.00		7.58
123	125	121	125	113	143	111	890	2,160	7% cum. "A" pfd.	100	244,000	7.00		
101	101	101	105	100	120	102	120	400	6% cum. "B" pfd.	100	103,000	6.00		
23½	32¾	23½	32¾	23	46½	22	15,000	35,100	Penick & Ford	No	425,000	1.00		4.01
31½	41¾	29⅝	42¾	29⅝	71¼	36⅜	71,900	228,500	Procter & Gamble	No	6,410,000	2.40	Yr. Je. '30	3.36
24⅛	27¼	24⅛	27¼	22½	51¾	23⅛	96,600	251,500	Standard Oil, Calif.	No	12,846,000	2.50		2.88
28⅜	31½	27⅞	31½	25⅜	52½	26	229,800	743,200	Standard Oil, N. J.	25	25,419,000	1.00		1.65
8⅜	10⅝	8⅜	10⅝	8⅜	26	8⅜	324,200	694,400	Standard Oil, N. Y.*	25	17,809,000	1.60		.92
1⅞	2⅝	1⅞	2⅝	1⅞	9½	2	4,100	12,000	Tenn. Corporation	No	857,000	1.00		1.21
21	26¾	21	26¾	20½	55¾	19½	61,900	180,400	Texas Gulf Sulphur	No	2,540,000	4.00	3.52	5.50
28⅛	36⅜	28	36⅜	27¼	72	27¼	270,800	701,500	Union Carbide & Carb.	No	9,001,000	2.60		3.12
12½	14	11⅞	14	9⅛	28¾	6⅛	20,100	31,000	United Carbon Co.	No	398,000		—	1.43
22⅛	31⅛	22⅛	31⅛	21⅝	77⅜	20⅜	168,500	398,100	U. S. Ind. Alc. Co.	No	374,000	6.00	—	z2.96
12¼	18⅝	12¼	18⅞	11½	76¾	11	68,520	850,600	Vanadium Corp. of Amer.	No	378,000	3.00		2.95
½	¾	½	⅞	½	3¼	½	2,600	5,100	Virginia Caro. Chem.	No	487,000		Yr. Je. '30	Nil
½	4½	½	4½	½	17	2¼	700	1,900	6% cum. part. pfd.	100	213,000		Yr. Je. '30	2.63
23¾	24½	23½	39½	23½	72	35	700	3,900	7% cum. prior pfd.	100	145,000	7.00	Yr. Je. '30	11.96
10½	12⅝	10½	12⅝	9	40	7⅝	3,800	7,900	Westvaco Chlorine Prod.	No		2.00	1.79	2.51

h 11 mos. ending Aug. 30

w 13 mos.

z Before inventory adjustment

* Socony Vacuum

NEW YORK CURB

1932 Mar. Last	1932 Mar. High	1932 Mar. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Mar.	During 1932	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1931	1930
6	6	6	6⅞	6	8½	5	100	1,200	Acetol Prod. conv. "A"	No	60,000			
1⅞	2⅜	1⅞	3	1⅞	19½	1¼	300	7,200	Agfa Ansco Corp.	No	300,000			
40	53¾	37¼	61¾	37¼	224	48	15,225	75,800	Aluminum Amer.	No	1,473,000			z1.93
50⅛	60	50⅛	67¾	50⅛	109⅝	56¾	1,500	5,700	6% cum. pfd.	100	1,473,000	6.00		
3⅛	5⅜	3⅛	5⅛	2⅞	12¾	2⅝	32,900	84,800	Amer. Cyanamid "B"	No	2,404,000			
¼	⅜	¼	⅝	¼	15	¼	1,400	4,900	Anglo-Chilean Nitrate	No	1,757,000		Yr. Je. '30	Nil
⅛	⅛	⅛	1⅛	⅛	4	⅛	100	400	Assoc. Rayon Corp.	No	1,200,000		Yr. Je. '30	1.87
...	...	...	...	...	60	32¼			conv. 6% cum. pfd.	100	200,000	6.00		

1932 Mar. Last	Mar. High	Mar. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Mar.	Sales During 1932	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$	1931	1930
1½	1¾	1⅝	1¾	1⅝	2⅝	⅞	4,100	7,500	Brit. Celanese Am. Rcts	2.43	2,806,000				
16	18¾	16	24¾	16	81½	16½	650	2,175	Celanese 7% cum. part. 1st pfd	100	148,000	7.00			
29	32	28	42	22	65	25	2,250	4,000	" 7% cum. prior pfd	100	115,000	7.00			
2⅜	3	2½	3	2⅜	...	...	800	1,250	Celluloid Corp.	No	195,000				
...	...	...	5⅞	5¼	9	5¾		200	Courtaulds, Ltd.	1£					
35⅛	35½	33⅞	35½	33⅞	51	30½	800	800	Dow Chemical	No	630,000	2.00			3.44
7½	8½	7¼	8½	6½	13	6½	300	1,100	Heyden Chemical Corp.	10	150,000				
2⅞	2⅞	2⅞	2⅞	2⅞	3⅛	2⅝	100	100	Imperial Chem. Ind.	1£				1.21	
...	...	...	...	...	...	...			Monroe Chem.	No	126,000				
...	...	...	...	...	60	20			Shawinigan W. & P.	No	2,178,000	2.50			
...	32½	27	32½	27	66½	34½	525	875	Sherwin-Williams Co.	25	636,000	4.00	Yr. Aug. '30		4.14
⅞	1	¾	1½	¾	12	⅞	2,200	6,100	Silica Gel Corp.	No	600,000				
15⅝	17½	16	...	...	38⅞	13½	89,700		Standard Oil Ind.	25	16,851,000	2.50			2.73
17⅛	18⅞	17	18⅞	16⅞	30⅜	14⅛	14,300	44,400	Swift & Co.	25	6,000,000	2.00			2.08
3⅞	5½	3	5½	1½	16	1½	13,500	25,800	Tubize "B"	No	600,000	10.00			
13½	16¼	12½	16¼	11½	...	...	1,300	2,100	United Chemicals $3 cum. part. pfd.	No	115,000	3.00			

CLEVELAND

1932 Mar. Last	Mar. High	Mar. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Mar.	Sales During 1932	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$	1931	1930
...	...	...	27	27	...	...		59	Cleve-Cliffs Iron ,$5 pfd.	No	498,000	5.00			11.42
30	35⅜	30	36	29½	51½	30	1,360	2,860	Dow Chemical Co.	No	630,000	2.00			3.44
28½	32½	26½	35	26½	68⅜	33⅞	3,280	7,335	Sherwin-Williams Co.	25	636,000	4.00	Yr. Aug. '30		4.14

CHICAGO

1932 Mar. Last	Mar. High	Mar. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Mar.	Sales During 1932	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$	1931	1930
27¾	30¾	26	31½	26	39⅞	26½	650	1,700	Abbott Labs.	No	145,000	2.50			3.32
4	4	4	4	3⅜	5½	3	50	340	Monroe Chem.	No	126,000			1.21	1.09
27½	31	27	32½	27	33	24	300	890	$3.50 cum. pref.	No	30,000	3.50			
17	19	17	19	16⅜	30½	16½	18,000	55,700	Swift & Co.	25	6,000,000	2.00			2.08

CINCINNATI

1932 Mar. Last	Mar. High	Mar. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Mar.	Sales During 1932	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$	1931	1930
33	41½	29⅞	42¾	29⅞	71	36⅞	15,108	27,420	Procter & Gamble	No	6,410,000	2.40	Yr. Je. '30		3.36

PHILADELPHIA

1932 Mar. Last	Mar. High	Mar. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Mar.	Sales During 1932	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$	1931	1930
...	...	...	35	35	75	37½		100	Pennsylvania Salt	50	150,000	5.00	Yr. Je. '30		7.97

The Industry's Bonds

NEW YORK STOCK EXCHANGE

1932 Mar. Last	Mar. High	Mar. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Mar.	Sales During 1932	ISSUE	Date Due	Int. %	Int. Period	Out-standing $
...	80	73⅛	80	69	99	69¼	14	34	Amer. Cyan. deb. 5s.	1942	5	A. O.	4,554,000
68¾	70½	68	70½	55	102	52	219	774	Amer. I. G. Chem. conv. 5½s.	1949	5½	M. N.	29,933,000
88¼	92¾	88	96	88	104½	85¾	294	818	Am. Smelt & Ref. 1st. 5s. "A"	1947	5	A. O.	36,578,000
10	12½	10	12½	7	63½	7½	53	224	Anglo-Chilean s. f. deb. 7s.	1945	7	M. N.	14,600,000
92¾	93¼	90½	93¼	85⅛	103	89	88	184	Atlantic Refin. deb. 5s.	1937	5	J. J.	14,000,000
55	55	55	60	55	104	59	6	9	Interlake Iron Corp. 1st 5½s "A"	1945	5½	M. N.	6,629,000
...	102	101⅝	103	100⅝	105⅜	100	26	58	Corn Prod. Refin. 1st s. f. 5s.	1934	5	M. N.	1,822,000
12	14½	9⅞	14½	9⅞	75½	6	603	1,160	Lautaro Nitrate conv. 6s.	1954	6	J. J.	32,000,000
74	76	71¾	76	69	96	67¾	65	207	Pure Oil s. f. 5½% notes	1937	5½	F. A.	17,500,000
85	86	84½	89	80	103	80	94	300	Solvay Am. Invest. 5% notes	1942	5	M. S.	15,000,000
101⅝	102	100¼	102	99½	105½	98¼	621	3,113	Standard Oil, N. J. deb. 5s.	1946	5	F. A.	120,000,000
91⅜	93⅞	91	93⅞	87	106½	85	190	521	Standard Oil, N. Y. deb. 4½s.	1951	4½	J. D.	50,000,000
...	83	78¾	83	50	99	45	342	353	Tenn. Corporation deb. 6s. "B"	1944	6	M. S.	3,308,000

NEW YORK CURB

1932 Mar. Last	Mar. High	Mar. Low	1932 High	1932 Low	1931 High	1931 Low	Sales In Mar.	Sales During 1932	ISSUE	Date Due	Int. %	Int. Period	Out-standing $
94¾	97	93	98⅞	91	105½	93½	182,000	837,000	Aluminum Co., s. f. deb. 5s.	1952	5	M. S.	37,115,000
...	74	70	74	64½	104¾	66	34,000	139,000	Aluminum Ltd., 5s.	1948	5	J. J.	20,000,000
17	17⅛	16½	22	15	56	10	21,000	37,000	Amer. Solv. & Chem. 6½s.	1936	6½	M. S.	1,737,000
25	25	24⅛	...	...	43	29	6,000	6,000	General Rayon 6s. "A"	1948	6	J. D.	5,085,000
94¾	96	93½	96	92½	103⅛	40½	147,000	558,000	Gulf Oil, 5s.	1937	5	J. D.	30,414,000
...	95	95	95½	92½	104	74	68,000	499,000	Sinking Fund deb. 5s.	1947	5	F. A.	35,000,000
85½	88	78½	88	64	102⅞	66	215,000	539,000	Koppers G. & C. deb, 5s.	1947	5	J. D.	23,050,000
71	76	70	76	67½	98⅜	56	281,000	620,000	Shawinigan W. & P. 4½s. "A"	1967	4½	A. O.	35,000,000
69	76	69	76	69	98½	58	182,000	288,000	4½s., series "B"	1968	4½	M. N.	16,108,000
100⅛	100¾	99½	100¾	98½	104	99⅞	106,000	355,000	Swift & Co., 5s.	1944	5	J. J.	22,916,000
...	101½	100¾	101½	99	104½	95	40,000	91,000	Westvaco Chlorine Prod. 5½s.	1937	5½	M. S.	1,992,000

Chemical Exports and Imports

U. S. Chemical Export Figures for January, 1931

ARTICLES, AND COUNTRIES TO WHICH EXPORTED	UNIT OF QUANTITY	JANUARY— 1931 Quantity	JANUARY— 1931 Value $8, 902, 031	JANUARY— 1932 Quantity	JANUARY— 1932 Value $6, 542, 639	SIX MONTHS ENDING DECEMBER— 1930 Quantity	SIX MONTHS ENDING DECEMBER— 1930 Value $56, 532, 913	SIX MONTHS ENDING DECEMBER— 1931 Quantity	SIX MONTHS ENDING DECEMBER— 1931 Value $45, 702, 122
GROUP 8.—CHEMICALS AND RELATED PRODUCTS									
A COAL-TAR PRODUCTS			1, 203, 266		664, 351		6, 926, 504		4, 958, 564
Benzol	Gal	2, 976, 513	595, 441	11, 321	4, 583	17, 597, 716	3, 475, 806	11, 349, 570	1, 883, 173
Crude coal tar	Bbl[1]	2, 129	8, 414	59, 997	139, 968	50, 476	143, 678	45, 428	124, 813
Coal-tar pitch	Ton	7, 565	68, 600	4, 400	41, 633	6, 025	73, 222	40, 687	385, 834
Creosote oil	Gal	602	235	1, 166	309			488, 039	72, 224
Coal-tar colors, dyes, stains, and color lakes	Lb	2, 066, 035	464, 494	1, 754, 141	411, 343	11, 874, 915	2, 643, 434	8, 495, 224	2, 061, 774
Other coal-tar products, exclusive of medicinals	Lb	702, 126	66, 082	512, 371	66, 515	22, 022, 012	590, 364	9, 199, 211	430, 746
C. INDUSTRIAL CHEMICAL SPECIALTIES			1, 047, 489		759, 631		7, 304, 334		6, 212, 172
Nicotine sulphate (40% basis)	Lb	43, 759	43, 173	5, 761	5, 393	117, 073	56, 463	29, 766	26, 630
Lead arsenate	Lb	160, 535	17, 211	17, 284	2, 576	1, 271, 624	146, 180	749, 109	68, 093
Calcium arsenate	Lb	142, 280	7, 507	399, 900	15, 141	1, 782, 447	86, 586	1, 102, 675	46, 122
Other agricultural insecticides, fungicides, and similar preparations and materials	Lb	628, 263	47, 498	308, 226	23, 574	3, 747, 441	341, 110	2, 358, 356	244, 813
Household insecticides and exterminators	Lb	393, 806	127, 112			5, 426, 993	1, 714, 332	2, 350, 996	653, 307
Liquid	Lb			155, 413	44, 725				
Powdered or paste	Lb			38, 223	12, 561				
Household disinfectants, deodorants, germicides and similar preparations	Lb	211. 374	31. 472	139. 717	11, 549	1, 116, 762	137, 075	959, 324	102, 738
D. INDUSTRIAL CHEMICALS			1, 671, 548		1, 467, 801		10, 402, 240		9, 231, 014
Acids and anhydrides—									
Organic (exclusive of coal-tar acids)	Lb	13, 555	3, 824	58, 432	5, 391			301, 498	40, 035
Inorganic—									
Nitric	Lb	11, 265	1, 362	11, 784	1, 376			134, 506	13, 982
Sulphuric	Lb	304, 745	5, 472	349, 100	5, 286	2, 664, 087	59, 508	1, 357, 713	26, 306
Hydrochloric (muriatic)	Lb	659, 393	9, 137	925, 719	12, 495			1, 183, 628	22, 660
Boric (boracic)	Lb	331, 741	17, 575	225, 957	12, 242	1, 391, 544	67, 022	2, 658, 062	115, 574
Other inorganic acids and anhydrides	Lb	146, 761	10, 805	684, 679	25, 009	5, 274, 683	405, 644	2, 230, 725	124, 378
Alcohols—									
Methanol	Gal	45, 139	$22, 969	36, 653	$18, 506	531, 849	$235, 065	322, 490	$127, 275
Glyceral (glycerin)	Lb	31, 872	4, 246	21, 307	2, 472	393, 690	71, 339	164, 723	26, 378
Butanol (butyl alcohol)	Lb	70, 780	10, 011	15, 462	2, 562			240, 652	26, 115
Other alcohols	Lb	9, 701	2, 367	146, 191	13, 928	1, 310, 896	192, 055	910, 980	101, 182
Acetone	Lb	224, 366	19, 557	610, 942	42, 559	2, 080, 535	170, 421	2, 018, 880	142, 916
Carbon tetrachloride	Lb	45, 266	1, 794	32, 621	1, 667			312, 678	18, 303
Carbon bisulphide	Lb	86, 721	5, 143	198, 215	12, 514			1, 314, 369	74, 198
Formaldehyde (formalin)	Lb	226, 528	13, 734	268, 613	14, 165	1, 109, 651	77, 374	1, 310, 487	68, 271
Ethylene compounds	Lb	48, 842	9, 529	41, 196	6, 923			431, 289	76, 279
Citrate of lime	Lb	266, 000	34, 000	703, 620	71, 275			2, 542, 052	265, 639
Other synthetic organic products	Lb	140, 115	21, 081	170, 363	28, 949	565, 436	119, 827	1, 108, 980	203, 362
Nitro or aceto cellulose solutions, collodion, etc	Lb	135, 806	40, 023	126, 969	24, 078	740, 463	213, 753	957, 151	232, 638
Ammonium compounds (except sulphate, phosphate, and anhydrous ammonia)	Lb	94, 428	5, 869	38, 281	3, 054	1, 310, 409	71, 329	516, 796	33, 725
Aluminum sulphate	Lb	4, 239, 852	49, 263	2, 959, 381	31, 952	26, 019, 302	294, 014	31, 913, 574	307, 072
Other aluminum compounds	Lb	308, 362	28, 806	52, 354	2, 941	1, 167, 496	112, 110	712, 457	66, 879
Calcium compounds—									
Carbide	Lb	130, 967	6, 825	356, 547	13, 768	1, 880, 501	85, 697	1, 325, 608	55, 688
Chlorinated lime (bleaching powder)	Lb	94, 750	4, 323	82, 616	2, 758	725, 313	31, 818	1, 065, 652	30, 273
Chloride	Lb	1, 095, 698	13, 304	349, 083	3, 651	11, 093, 786	130, 181	13, 817, 522	161, 773
Other, except arsenate, cyanide, and nitrate	Lb	156, 934	8, 010	156, 900	9, 620	2, 513, 604	320, 171	762, 657	44, 151
Copper sulphate (blue vitriol)	Lb	981, 754	39, 609	521, 629	15, 882	2, 693, 862	126, 058	2, 929, 375	101, 868
Hydrogen peroxide (or dioxide)	Lb	100, 167	18, 430	65, 299	9, 365	1, 097, 486	167, 315	576, 886	81, 988
Potassium compounds (not fertilizers)	Lb	105, 999	19, 424	140, 844	29, 851	1, 108, 831	222, 780	1, 175, 464	190, 430
Sodium compounds	Lb	39, 725, 299	884, 497	42, 019, 049	818, 455	226, 765, 075	4, 743, 901	246, 509, 431	4, 765, 340
Bichromate and chromate	Lb	267, 142	16, 184	730, 205	42, 982	2, 138, 313	132, 436	2, 302, 053	148, 605
Cyanide	Lb	73, 153	12, 466	58, 251	9, 401	649, 567	96, 369	668, 050	93, 694
Borate (borax)	Lb	14, 170, 780	358, 606	20, 767, 236	370, 254	69, 900, 569	1, 383, 979	97, 663, 759	1, 772, 111
Silicate (water glass)	Lb	4, 973, 973	41, 607	5, 041, 540	41, 564	30, 215, 680	274, 239	29, 417, 122	261, 012
Soda ash	Lb	5, 271, 978	81, 158	1, 982, 993	31, 600	26, 457, 249	457, 176	22, 898, 855	355, 957
Sal soda	Lb	873, 224	10, 935	677, 705	10, 750	6, 046, 817	89, 966	4, 383, 739	63, 522
Bicarbonate (acid soda or baking soda)	Lb	1, 758, 624	33, 310	1, 245, 972	23, 423	9, 863, 320	181, 595	9, 461, 529	162, 937
Sulphate	Lb	457, 147	5, 495	48, 076	1, 283	5, 422, 136	62, 467	4, 374, 566	34, 497
Bisulphate (niter cake)	Lb	841, 831	6, 174	138, 183	665			9, 384, 142	45, 799
Hydroxide (caustic soda)	Lb	9, 753, 146	270, 606	10, 493, 194	247, 021	55, 693, 367	1, 637, 949	60, 056, 951	1, 546, 916
Sulphide	Lb	159, 519	3, 427	65, 643	1, 660			261, 589	6, 344
Fluorides	Lb	325	34	40, 980	3, 314			19, 739	1, 790
Sodium phosphate (mono, di, or tri)	Lb	323, 630	10, 981	281, 256	8, 370			5, 069, 474	92, 250
Other sodium compounds	Lb	800, 827	33, 514	447, 815	26, 168	20, 378, 057	427, 725	2, 547, 863	179, 906
Tin compounds	Lb	87, 864	15, 535	14, 612	3, 581	242, 410	53, 553	282, 291	55, 146
Zinc compounds	Lb	106, 193	5, 651	23, 518	2, 889	1, 563, 854	64, 850	916, 425	39, 903
Gases, compressed, liquefied, and solidified—									
Ammonia, anhydrous	Lb	148, 014	23, 087	209, 968	26, 463	876, 509	120, 482	583, 012	82, 635
Chlorine	Lb	944, 941	40, 712	555, 715	14, 368	4, 207, 239	135, 512	4, 125, 531	110, 283
Other gases, n. e. s	Lb	154, 689	30, 529	126, 948	20, 648	1, 032, 822	170, 647	1, 242, 206	188, 539
Other industrial chemicals			245, 045		157, 158		1, 939, 814		1, 209, 830
E. PIGMENTS, PAINTS, AND VARNISHES			1, 532, 207		949, 404		9, 238, 548		6, 748, 671
Mineral earth pigments	Lb					28, 433, 437	252, 993		
Ocher, umber, sienna, and other forms of iron oxide for paints	Lb	757, 836	20, 795	474, 667	11, 537			11, 163, 951	127, 529
Other mineral-earth pigments (whiting, barytes, etc.)	Lb	772, 092	13, 233	740, 089	9, 476			7, 211, 312	62, 012

ARTICLES, AND COUNTRIES TO WHICH EXPORTED	UNIT OF QUANTITY	JANUARY—				SIX MONTHS ENDING DECEMBER—			
		1931		1932		1930		1931	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
GROUP 8.—CHEMICALS AND RELATED PRODUCTS—Continued.									
Chemical pigments—									
Zinc oxide	Lb	1,234,102	87,330	394,395	28,521	8,542,840	552,637	4,009,294	277,104
Lithopone	Lb	612,405	26,960	477,103	20,659	2,802,625	144,440	2,597,906	116,568
Bone black and lampblack	Lb	231,078	10,580	59,577	5,063	1,553,067	77,497	1,281,221	57,758
Carbon black or gas black	Lb	8,820,027	571,259	8,200,319	392,157	37,270,728	2,390,366	51,566,983	2,547,214
Red lead, litharge, and orange mineral	Lb	627,460	45,675			3,089,000	220,273	2,269,108	136,496
Red lead	Lb			76,230	5,532				
Litharge	Lb			154,791	8,001				
White lead	Lb	1,160,951	69,551			7,176,030	492,968	4,353,615	238,418
Dry	Lb			915,174	43,430				
In oil	Lb			100,427	9,146				
Other chemical pigments	Lb	526,580	60,443	334,076	48,463	2,276,539	317,259	2,263,407	299,374
Bituminous paints, liquid and plastic			41,679		7,638		306,138		234,521
Paste paint	Lb	275,054	35,901	150,052	26,331	814,370	154,181	2,078,948	266,316
Kalsomine or cold-water paints, dry	Lb	598,366	29,188	532,584	28,580	3,767,333	196,073	3,065,643	163,439
Nitrocellulose (pyroxylin) lacquers—									
Pigmented	Gal	21,985	66,603	20,024	52,034	99,891	344,986	141,283	398,035
Clear	Gal	10,067	24,508	6,434	12,760	32,862	71,935	39,638	79,161
Thinners for nitrocellulose lacquers	Gal	18,445	25,323	19,922	22,263			124,051	154,894
Ready-mixed paints, stains, and enamels	Gal	165,192	349,050	88,751	181,734		2,559,664	641,861	1,341,770
Varnishes (oil or spirit, and liquid dryers)	Gal	40,707	52,117	29,122	34,918	314,110	589,926	177,427	236,911
Paint and varnish removers	Gal	1,662	2,012	942	1,161		567,212	7,694	11,151
F FERTILIZERS AND FERTILIZER MATERIALS	Ton	94,096	1,044,447	79,242	978,096	671,870	5,852,073	589,168	5,312,018
Nitrogenous fertilizer materials—									
Ammonium sulphate	Ton	12,365	386,974	7,725	227,364	32,226	1,050,129	12,418	380,860
Other nitrogenous materials	Ton					15,561	659,457		
Other nitrogenous chemical materials	Ton	795	26,419	11,813	324,987			35,191	1,185,696
Nitrogenous organic waste materials	Ton	171	3,040	62	882			3,318	58,964
Phosphatic fertilizer materials—									
Phosphate rock—									
High-grade hard rock	Ton	228	2,583	11,035	61,845	28,353	194,986	87,430	519,118
Land pebble	Ton	67,791	275,389	44,237	186,348	520,534	2,335,003	389,381	1,735,531
Superphosphate (acid phosphate)	Ton	5,501	62,924	2,618	30,126	46,338	639,262	34,947	393,169
Other phosphate materials	Ton	1,633	61,131	310	91,703			1,373	67,660
Potassic fertilizer materials	Ton					6,482	288,267		
Potassium chloried or muriate	Ton	1,295	58,586					8,472	371,527
Other potash fertilizers	Ton	591	20,806	1	81			136	3,861
Concentrated chemical fertilizers	Ton					15,821	$446,413	13,999	$497,152
Nitrogenous phosphatic types	Ton	3,231	$131,620	1,419	$53,802			20	800
Nitrogenous potassic types	Ton							121	2,818
Nitrogenous phosphatic potassic types	Ton								
Prepared fertilizer mixtures	Ton	495	14,975	22	958	6,555	238,556	2,362	94,862

U. S. Chemical Import Figures for January

ARTICLES, AND COUNTRIES FROM WHICH IMPORTED	UNIT OF QUANTITY	JANUARY—				SIX MONTHS ENDING DECEMBER—			
		1931		1932		1930		1931	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
GROUP 8.—CHEMICALS AND RELATED PRODUCTS			7,166,299		4,791,003		46,444,012		36,258,420
A. COAL-TAR PRODUCTS			795,791		715,920		6,912,362		5,552,319
Crude—									
Dead or creosote oil ... free	Gal	3,619,960	374,208	3,213,363	304,600	28,832,644	3,252,239	18,027,618	1,749,164
All other ... free			71,259		49,486		423,310		387,251
Intermediates—									
Acids ... dut	Lb	160,756	10,749	28,873	49,422	504,684	30,739	341,021	52,661
All other ... dut	Lb	83,800	35,185	51,134	23,867	561,182	384,858	422,109	345,182
Finished products—									
Colors, dyes, stains, color acids, and color bases, n. e. s. ... dut	Lb	217,459	258,268	243,754	273,746	2,301,920	2,487,597	2,511,443	2,719,765
Belgium	Lb	5,384	6,004	2,097	2,355	31,985	42,574	22,509	26,085
France	Lb	2,744	4,773	56	128	30,135	39,423	2,091	2,951
Germany	Lb	167,055	190,871	125,812	136,157	1,311,470	1,422,513	1,429,711	1,541,584
Italy	Lb	4,498	4,148	1,133	1,384	21,166	24,449	2,447	4,291
Switzerland	Lb	32,619	45,197	101,911	119,768	808,809	854,633	982,957	1,077,482
United Kingdom	Lb	2,757	3,505	11,446	12,614	71,637	77,251	47,954	51,017
Coal-tar medicinals ... dut	Lb	8,539	26,534	1,512	9,867	19,449	93,320	16,322	141,909
Other finished coal-tar products ... dut	Lb	6,011	19,588	2,385	4,932	88,317	240,299	50,525	156,387
B. MEDICINAL AND PHARMACEUTICAL PREPARATIONS			396,959		295,617		2,084,828		1,785,054
Quinine sulphate ... free	Oz	110,000	39,938	12,000	3,929	489,276	167,969	866,607	259,906
Other quinine and other alkaloids and salts from cinchona bark ... free	Oz	3,480	1,792	82,000	19,388	370,172	160,859	700,601	277,654
Other alkaloids, salts, and derivatives ... dut			12,108		7,943		154,088		40,370
Antitoxins, serums, vaccines, etc., and blistering beetles ... free					114		4,175		1,306
Menthol ... dut	Lb	26,645	77,464	32,880	78,496	129,353	400,661	131,128	347,828
Santonin and salts ... free	Lb	12	1,606			273	32,049	314	28,331
Other medicinals ... dut			15,654		4,521		52,697		26,264
All other preparations, n. e. s. ... dut			248,397		181,226		1,112,330		803,395
D. INDUSTRIAL CHEMICALS			1,301,333		1,250,174		10,666,197		7,876,661
Acetylene, butylene, ethylene, and propylene derivatives ... dut	Lb	16,939	1,935	16,910	2,007	265,235	28,438	248,631	24,893
Acids and anhydrides—									
Acetic or pyroligneous ... dut	Lb	859,000	42,158	665,070	36,024	5,929,820	333,538	5,151,780	317,989
Arsenious (white arsenic) ... free	Lb	626,202	20,879	730,719	18,579	8,944,186	329,330	6,350,759	189,374
Formic ... dut	Lb			11,134	623	192,249	12,954	69,238	3,832
Oxalic ... dut	Lb	36,656	1,922	26,578	1,449	247,652	13,085	205,114	10,736
Sulphuric (oil of vitriol) ... free	Lb			101,400	659	630,771	4,160	1,466,585	15,443
Tartaric ... dut	Lb	131,600	30,166	341,460	61,554	1,484,475	353,448	1,104,055	227,935
All other ... free	Lb	63,307	2,927			62,023	3,445	140	123
All other ... dut	Lb	36,444	6,616	16,144	2,860	1,123,158	115,519	558,668	106,814

U. S. Chemical Import Figures *(Continued)*

ARTICLES, AND COUNTRIES FROM WHICH IMPORTED	UNIT OF QUANTITY	JANUARY— 1931		JANUARY— 1932		SIX MONTHS ENDING DECEMBER— 1930		SIX MONTHS ENDING DECEMBER— 1931	
		Quantity	*Value*	*Quantity*	*Value*	*Quantity*	*Value*	*Quantity*	*Value*
Alcohols, n. e. s., including fusel oil......dut..			631		179		5,647		5,236
Ammonium compounds, n. e. s.—									
Chloride (muriate)......dut..	Lb.	625,504	18,991	405,733	10,962	2,658,658	84,504	2,601,797	73,522
Nitrate......dut..	Lb.	539,302	16,284	602,395	16,350	3,305,660	102,054	3,173,255	89,716
All other......dut..	Lb.	56,792	3,032	8,792	549	270,943	16,652	236,468	13,709
Barium compounds......dut..	Lb.	301,478	4,454	119,636	1,969	2,885,331	44,162	1,217,062	27,816
Calcium compounds, n. e. s......dut..	Lb.	80,000	3,000			1,101,960	42,088	204,000	7,388
Cellulose products, n. e. s.—									
Acetate......dut..	Lb.	527	577	477	520	5,078	6,864	29,513	24,346
All other—									
Sheets more than 1/1000-inch thick, and other forms......dut..	Lb.	7,265	16,375	15,366	7,231	139,922	135,593	77,857	82,633
Sheets and strips, more than 1 inch wide, not over 1/1000-inch thick......dut..	Lb.	5,996	2,551	5,813	4,338	201,619	80,753	12,856	10,206
Cobalt oxide......dut..	Lb.	17,980	$30,165	15,715	$16,671	220,209	$390,200	186,586	$201,261
Copper sulphate (blue vitriol)......free..	Lb.	260,502	10,312	1,747,327	46,325	2,075,490	88,656	1,213,372	48,055
Glycerin—									
Crude......dut..	Lb.	1,225,955	70,803	806,084	35,528	6,339,913	355,687	4,647,614	218,547
Refined......dut..	Lb.	257,882	23,824	120,446	8,079	2,243,989	187,255	1,310,820	83,903
Iodine, crude......free..	Lb.	30,215	113,983	17,948	59,744	254,744	926,485	89,585	308,560
Lime, chlorinated, or bleaching powder..dut..	Lb.	158,740	5,096	162,457	3,767	968,453	28,174	1,041,453	29,195
Magnesium compounds......dut..	Lb.	824,568	13,819	794,880	8,186	4,122,835	65,862	6,876,213	97,017
Potassium compounds, n. e. s.—									
Argols, tartar, and wine lees......free..	Lb.	1,387,714	126,090	1,512,681	81,705	9,979,174	966,075	11,007,621	822,736
Carbonate......dut..	Lb.	515,896	24,583	740,405	29,244	7,596,542	352,786	6,430,554	269,965
Chlorate and perchlorate......dut..	Lb.	1,753,363	62,338	665,617	24,569	8,720,950	312,485	5,567,268	195,918
Cream of tartar......dut..	Lb.	36,400	6,676	5,500	705	46,269	8,493	34,836	5,342
Cyanide......free..	Lb.	1,653	547			26,615	9,826	63,434	22,863
Hydroxide (caustic potash)......dut..	Lb.	543,240	26,568	480,501	23,671	4,298,634	221,471	4,456,212	228,076
Nitrate, crude (saltpeter)......free..	Ton.	1,309	61,614	2,109	80,009	5,894	264,310	8,292	343,267
Other potassium compounds, n. e. s...dut..	Lb.	346,416	15,335	280,024	14,623	1,306,430	87,993	3,301,427	158,984
Sodium compounds, n. e. s.—									
Sulphate, crude (salt cake)......free..	Lb.	11,766,411	59,329	14,145,345	79,091			51,337,104	273,242
Cyanide......free..	Lb.	1,016,200	77,660	1,395,839	146,211	12,961,713	1,019,136	9,180,505	992,766
Ferrocyanide (yellow prussiate)......dut..	Lb.	151,878	12,672	50,490	4,279	809,680	68,840	422,025	36,125
Nitrite......dut..	Lb.					29,383	1,318	1,979	288
Phosphate (except pyrophosphate)....dut..	Lb.	188,164	3,006	2,205	61	1,423,266	25,343	467,691	11,253
Other sodium compounds, n. e. s......free..	Lb.	176	33			54,102,133	312,916	1,140,942	16,552
Other sodium compounds, n. e. s......dut..			53,509		34,527		431,801		253,948
Radium salts......free..	Grain.				700	201	727,193	108	376,229
Other industrial chemicals......free..			165,802		238,679		958,037		728,959
Other industrial chemicals......dut..			165,071		147,947		1,143,621		921,899
E. PIGMENTS, PAINTS, AND VARNISHES......			130,531		121,457		1,066,623		1,017,339
Mineral earth pigments—									
Iron oxide and iron hydroxide......dut..	Lb.	433,602	15,041	630,602	15,683	7,771,040	163,058	6,367,024	124,528
Ochers and siennas......dut..	Lb.	807,317	18,851	691,514	11,677	6,491,129	115,736	6,588,448	92,186
Other mineral earth pigments......dut..			45,476		6,988		164,627		249,475
Chemical pigments—									
Lithopone and zinc pigments, n. e. s...dut..	Lb.			1,134,000	32,222	4,515,861	218,853	5,715,739	199,353
Zinc oxide and leaded zinc oxide......dut..	Lb.	172,464	13,274	548,696	25,568	1,189,907	86,106	1,287,802	80,684
Other chemical pigments......dut..	Lb.	179,561	15,080	254,599	15,695		154,467	2,388,473	135,675
Paints, stains, and enamels......dut..			18,796		12,030		141,904		122,772
Varnishes......dut..	Gal.	2,540	4,013	770	1,594	13,355	21,872	5,335	12,666
F. FERTILIZERS AND MATERIALS......	Ton.	134,990	4,334,538	87,104	2,263,163	824,992	23,290,056	631,377	18,311,447
Nitrogenous—									
Ammonium sulphate......free..	Ton.	13,742	514,790	19,187	435,690	30,774	1,051,961	78,304	1,932,595
Ammonium sulphate-nitrate......free..	Ton.	811	36,120	75	3,784	4,087	192,184	3,008	112,268
Calcium cyanamid or lime nitrogen....free..	Ton.	5,167	166,573	5,190	113,096	40,796	1,315,138	15,475	362,111
Calcium nitrate......free..	Ton.	4,573	147,358	1,429	38,065	3,082	107,253	2,686	67,434
Guano......free..	Ton.	1,614	61,638	3,209	52,130	24,777	925,837	385	8,205
Dried blood......free..	Ton.	818	44,199	708	19,566	5,141	264,658	3,384	104,112
Sodium nitrate......free..	Ton.	45,840	1,719,166	30,114	925,163	155,982	5,665,192	184,648	6,969,707
Urea and calurea......free..	Ton.	1,241	104,657	946	67,569	7,927	713,883	3,297	258,156
Other nitrogenous......free..	Ton.	6,478	158,363	217	5,754	45,140	1,133,233	8,389	184,854
Phosphates—									
Bone ash, dust, and meal, and animal carbon fertilizers......free..	Ton.	6,279	152,973	3,670	74,278	28,027	658,061	20,299	394,990
Other phosphate materials......free..	Ton.			1,847	24,642	6,956	92,995	12,307	169,723
Potash fertilizers—									
Chloride, crude (muriate)......free..	Ton.	15,879	590,030	8,313	286,972	150,347	5,392,185	113,740	3,991,662
Kainite......free..	Ton.	8,346	78,380	2,311	18,561	51,639	482,829	14,736	123,547
Manure salts......free..	Ton.	13,896	237,112	3,631	45,080	191,771	2,712,777	108,860	1,569,302
Sulphate, crude......free..	Ton.	3,514	163,289	1,986	89,860	47,812	2,157,885	36,654	1,680,681
Other potash-bearing substances......free..	Ton.	28	183	27	814	144	977	195	1,297
Fertilizers, compounded, or chemically combined, containing nitrogen, phosphoric acid and potash......free..	Ton.	1,500	90,407	108	6,077	1,566	93,710	2,005	112,391
All other......free..	Ton.	5,264	69,300	4,136	56,062	29,024	329,298	23,005	268,412
G. EXPLOSIVES......			10,384		4,203		124,426		91,202
Powder and other explosives, n. e. s......dut..			76		46		4,086		20
Firecrackers......dut..	Lb.	14,176	1,983	17,525	1,977	688,492	92,204	598,384	75,605
Fireworks and ammunition......dut..			8,325		2,180		28,136		15,577
H. SOAP AND TOILET PREPARATIONS......			196,675		135,653		2,225,328		1,582,346
Soap—									
Castile......dut..	Lb.	263,281	27,522	211,099	18,651	1,540,614	139,554	1,318,012	118,634
Toilet......dut..	Lb.	67,922	18,591	38,466	11,459	866,639	278,042	673,109	198,832
All other......dut..	Lb.	101,766	12,843	187,315	11,608	718,055	80,185	926,029	106,093
Perfume materials......free..	Lb.	424	26,914	225	16,786	3,645	363,942	8,191	168,979
Perfume materials......dut..			45,995		42,138		552,810		279,718
Perfumery, bay rum, and toilet water...dut..			38,631		19,738		507,159		475,158
Bath salts......dut..	Lb.	1,009	254	665	165	32,970	10,048	7,500	2,340
Cosmetics, powders, creams, etc......dut..			25,925		15,108		293,588		232,592
I. ARTICLES IN GROUP 8, ORDINARILY DUTIABLE, IMPORTED FREE......free..			88		4,816		74,192		42,052

Compiled from Monthly Summary of Foreign Trade of the United States, of the Dept. of Commerce

The Trend of Prices

Business uncertainty continues in March. Prices show further recessions as the country looks to Washington. Chemical Markets' Average Price for 20 representative industrial chemicals is lower; Chemical indices of the National Fertilizer Association, N. Y. Journal of Commerce, and The Annalist also are lower.

Despite a turn in the price of calcium acetate and corresponding increases in the various grades of acetic acid chemical markets went through another month of important price declines. Sharing with the acetic group in the list of advances were dibutyl phthalate, linseed oil, potassium carbonate, turpentine, quicksilver and sodium silicofluoride. On the other side were boric, citric, and imported tartaric acids, borax, all grades of glycerine, and both domestic and French zinc oxide.

Borax Reduced

By far the most important declines announced during the month were those made in the price of borax and boric acid, and zinc oxide. The present recession in borax is the first to occur during the present depression. The reductions are large and should stimulate further consumption in the vitreous enamel and glass industries and lead to the introduction of new uses. Likewise the decline in zinc oxide is the first to take place in several years and brings the price more nearly in line with the prevailing market for the metal and competing products.

The indices of the National Fertilizer Association show moderate declines in the Fats and Oil Group and Fertilizer Materials; with no change in Chemicals and Drugs and a small rise in Mixed Fertilizers. The indices by week follow:

	Fats & Oils	*Chem. & Drugs*	*Fert. Mat.*	*Mixed Fert.*
Feb. 27....	48.0	88.8	70.1	76.9
March 5....	46.4	88.8	69.2	76.9
March 12...	48.0	88.8	69.3	76.9
March 19...	47.1	88.8	69.2	77.3

The index of chemical prices of the Annalist declined from 96.5 to 96.1 and that of the N. Y. Journal of Commerce from 81.3 to 80.9.

Consuming Industries

Conditions in the consuming industries remains unchanged from last month. Buying is still being done in relatively small quantities. The situation in the fertilizer field has been further complicated by mixers holding off, due, partly to the cold weather generally prevailing in March, and to a greater degree, by the fact that consumption of fertilizer is expected to be much lower in the current year. Activity in textiles slowed down slightly from the pace set in February and further curtailment is expected. The glass, paper, and leather industries are still operating at very reduced schedules but a seasonal spurt of extremely modest proportions was noted in the paint and varnish and lacquer fields. Further improvement in the last is momentarily expected based on the re-entry of Ford and the introduction of new models by several automobile producers. There is no gain saying the fact that with March usually the heaviest consuming month of the year that shipments were disappointing to most producers although they did exceed February or January in point of total volume.

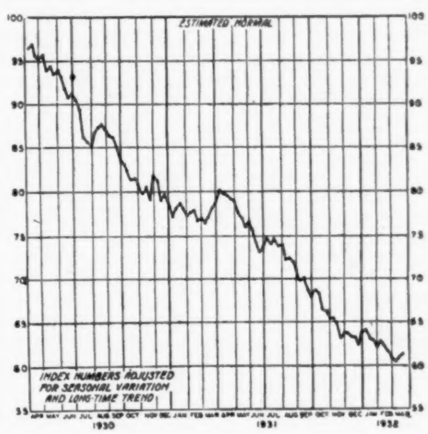
General Business

Business generally, apparently willing to go ahead, was checked abruptly by the uncertainty surrounding the new tax bill. Instead of a sound sales tax which would have distributed the burden of raising more money for federal expenses equitably and in a manner least likely to be felt, income taxes both personal and those of corporations have been increased alarmingly in the bill as it leaves the House. Nuisance taxes on automobiles, radios, mechanical refrigerators, and several other products have been added. The effect of these are bound to be felt in the sales volume. What the Senate will do to the bill is a matter of conjecture at this point but prices are bound to suffer for several months to come because of the uncertainty.

More seasonal weather in the past ten days helped to stir up retail trade. Jobbing and wholesale lines are quiet. Collections are notably slow. Lead by the turn downward in the stock market commodity markets with few exceptions went into new low ground. Definite improvement in the steel industry is still lacking. The one bright hope is that of renewed activity at Detroit with its accompanying improvement in employment and demand for steel and other raw commodities.

Business Activity

The N. Y. Times Weekly Business Index shows a very slight rise. The preliminary figure for the week ended



March 19 was 61.3, as against 61.0 (revised) for the week ended March 12 and 60.4 for the week ended March 5.

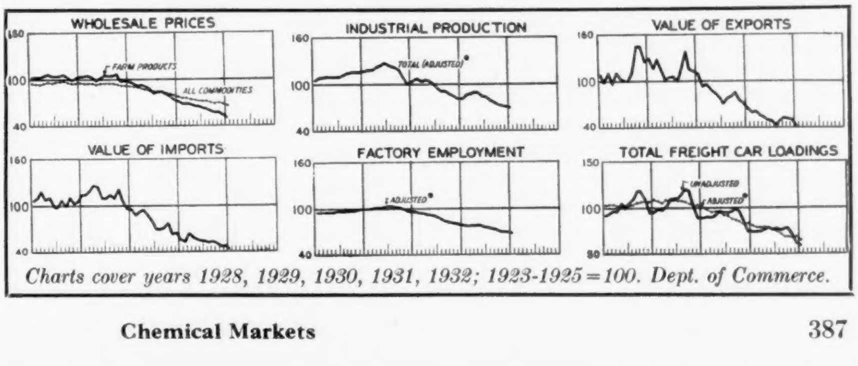
	Week Ended Mar. 19, 1932	*Mar. 12, 1932*	*Mar. 21, 1931*
Freight car loadings..	*62.1	61.4	79.1
Steel mill activity...	27.2	28.0	58.0
Elec. power productn.	72.9	72.3	85.8
Automobile productn.	33.5	34.8	60.2
Carded cot. cloth production.......	91.2	91.4	85.5
Combined index.....	*61.3	61.0	78.2

*Subject to revision.

Indices of Business

	Latest Available Month	Previous Month	Year Ago
Automobile Production, Jan.	119,344	121,541	171,848
†Brokers Loans, March 1	$524	$512	$1,839
*Building Contracts, Feb.	$89,045	$84,798	$235,405
*Car Loadings, March 26	575	559	733
†Commercial Paper, Feb. 29	$103	$108	$315
Payrolls, Feb.	53.6	52.4	73.2
*Mail Order Sales, Feb.	31,975	58,821	41,459
Failures, Dun, Feb.	2,732	3,458	2,563
*Merchandise Imports, Feb.	$131,000	$136,000	$174,946
*Merchandise Exports, Feb.	$155,000	$150,000	$224,346
Furnaces in Blast, March 1	22.8	21.4	34.4
*Steel Orders, Feb. 29	2,545	2,648	3,965

*000 omitted. †000,000 omitted.



Charts cover years 1928, 1929, 1930, 1931, 1932; 1923-1925 = 100. Dept. of Commerce.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - March 1932 $1.59

Important Price Changes

Advances

Advances	Mar.	Feb.
Acid Acetic 28%	$2.75	$2.50
Acid Acetic 56%	5.10	4.60
Acid Acetic Glacial	8.89	8.10
Calcium Acetate	2.50	2.00
Dibutyl phthalate	.23½	.228
Linseed Oil	.068	.006
Potassium Carbonate		
80-85% cal.	.049	.0475
96-98% cal.	.0533	.0549
83-85% hyd.	.0501	.0525
Turpentine	.45¼	.41¼
Quicksilver	$74.50	$67.50
Sodium Silicofluoride	.06	.05½

Declines

Declines		
Acids, Boric Acid, carlots, contract, gran.	80.00	125.00
Tartaric acid, imp.	.24½	.25½
Ammonium sulfate, dom.	$20.00	$22.00
Borax, carlots, contract	$36.00	$45.00
Camphor, slabs	.46	.49
Camphor, powdered	.47	.50
Diphenyl oxide	1.05	1.10
Egg Yolk, gran.	.49	.51
Egg Yolk, spray	.52	.54
Glycerine, dynamite	.08	.09
Glycerine, saponification	.05	.06
Glycerine, soap lye	.04	.04⅝
Glycerine, C. P	.10¼	.10½
Linseed Meal	$30.50	$31.50
Tartaric emetic	.23½	.24
Zinc Oxide, American proc.	.05¾	.06½
French process, red seal.	.08⅝	.09⅜

Average Price

CHEMICAL MARKETS' Average Price for 20 representative industrial chemicals declined further in March due to the delayed reductions in zinc oxide and despite the increase in acetic acid. The new level is now .0630 cents against .0632 cents in February. The price in March 1931 stood at .0662 cents and .0727 cents in March 1930.

Acetone —The long looked for expansion due to the increase in activity in automobile centers failed to materialize in March. Shipments were, however, in fair quantities and the market maintained a firm appearance.

Acid Acetic — The increase in calcium acetate of 50c per hundred pounds was immediately followed by a rise in acid prices. The new schedule is based on $2.75 per hundred pounds for 28% commercial, spot sales, and $2.65 on contract. The higher grades are scaled higher in proportion. Glacial is now quoted at $8.89. American imports of acetic acid are entered for the most part through the St. Lawrence customs district as may be seen from the following table:

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Acetaldehyde, drs lc-1 wks...lb.	.18½	.21	.18½	.21	.18½	.21	.21	.18½
Acetaldol, 50 gal dr...lb.	.27	.31	.27	.31	.27	.31	.31	.27
Acetamide...lb.	.95	1.35	.95	1.35	.95	1.35	1.35	1.20
Acetanilid, tech, 150 lb bbl...lb.	.22	.23	.22	.23	.22	.23	.23	.21
Acetic Anhydride, 92-95%, 100 lb cbys...lb.	.21	.25	.21	.25	.21	.25	.29	.25
Acetin, tech drums...lb.	.30	.32	.30	.32	.30	.32	.32	.30
Acetone, tanks,...lb.	...	.10	...	.10	.10	.10½	.12	.11
Acetone Oil, bbls NY...gal.	1.15	1.25	1.15	1.25	1.15	1.25	1.25	1.15
Acetyl Chloride, 100 lb cby...lb.	.55	.68	.55	.68	.55	.68	.68	.55
Acetylene Tetrachloride (see tetrachlorethane)...								
Acids								
Acid Abietic...	.12	.12	.12	.12	.12	.12	.....	.....
Acetic, 28% 400 lb bbls c-1 wks...100 lb.	.....	2.75	2.40	2.75	2.40	2.60	3.88	2.60
Glacial, bbl c-1 wk...100 lb.	.....	9.14	8.35	9.14	8.35	9.23	13.68	9.23
Glacial, tanks...	.....	8.89	8.10	8.89	8.10	8.98	13.43	8.98
Adipic...	.72	.72	.72	.72	.72	.72	.....	.....
Anthranilic, refd, bbls...lb.	.85	.95	.85	.95	.85	.95	1.00	.85
Technical, bbls...lb.	.65	.70	.65	.70	.65	.80	.80	.75
Battery, cbys...100 lb.	1.60	2.25	1.60	2.25	1.60	2.25	2.25	1.60
Benzoic, tech, 100 lb bbls...lb.	.35	.45	.35	.45	.35	.45	.53	.40
Boric, powd, 250 lb. bbls...lb.	.0425	.05	.0425	.07	.06½	.07¾	.07¾	.06¾
Broenner's, bbls...lb.	1.20	1.25	1.20	1.25	1.20	1.25	1.25	1.20
Butyric, 100% basis cbys...lb.	.80	.85	.80	.85	.80	.85	.90	.80
Camphoric...lb.	.....	5.25	.....	5.25	.....	5.25	5.25	5.25
Chlorosulfonic, 1500 lb drums wks...lb.	.04½	.05½	.04½	.05½	.04½	.05½	.05½	.04½
Chromic, 99¾%, drs...lb.	.13¼	.14½	.13¼	.14½	.14½	.17	.19	.15
Chromotropic, 300 lb bbls...lb.	1.00	1.06	1.00	1.06	1.00	1.06	1.06	1.00
Citric, USP, crystals, 230 lb bbls...lb.	.....	.32	.32	.33½	.33½	.43	.59	.40
Cleve's, 250 lb bbls...lb.	.52	.54	.52	.54	.52	.54	.54	.52
Cresylic, 95%, dark drs NY...gal.	.42	.47	.42	.47	.42	.60	.70	.54
97-99%, pale drs NY...gal.	.49	.50	.49	.50	.49	.60	.77	.58
Formic, tech 90%, 140 lb. cby...lb.	.10½	.12	.10½	.12	.10½	.12	.12	.10½
Gallic, tech, bbls...lb.	.60	.70	.60	.70	.60	.70	.55	.50
USP, bbls...lb.	.....	.74	.....	.74	.....	.74	.74	.74
Gamma, 225 lb bbls wks...lb.	.75	.77	.75	.80	.77	.80	.80	.77
H, 225 lb bbls wks...lb.	.60	.65	.60	.65	.60	.70	.70	.65
Hydriodic, USP, 10% soln cby lb.	.....	.67	.....	.67	.....	.67	.67	.67
Hydrobromic, 48%, coml, 155 lb cbys wks...lb.	.45	.48	.45	.48	.45	.48	.48	.45
Hydrochloric, CP, see Acid Muriatic...							.....	.....
Hydrocyanic, cylinders wks...lb.	.80	.90	.80	.90	.80	.90	.90	.80
Hydrofluoric, 30%, 400 lb bbls wks...lb.	.....	.06	.....	.06	.....	.06	.06½	.06
Hydrofluosilicic, 35%, 400 lb bbls wks...	...11	.12	.11	.12	.11	.12	.12	.11
Hypophosphorous, 30%, USP, demijohns...lb.	.....	.85	.....	.85	.....	.85	.85	.85
Lactic, 22%, dark, 500 lb bbls lb.	.04	.04½	.04	.04½	.04	.04½	.05	.04
44%, light, 500 lb bbls...lb.	.11½	.12	.11½	.12	.11½	.12	.12	.11
Laurent's, 250 lb bbls...lb.	.36	.42	.36	.42	.36	.42	.42	.36
Linoleic...lb.	.16	.16	.16	.16	.16	16	.....	.....
Malic, powd., kegs...lb.	.45	.60	.45	.60	.45	.60	.60	.45
Metanilic, 250 lb bbls...lb.	.60	.65	.60	.65	.60	.65	.65	.60
Mixed Sulfuric-Nitric								
tanks wks...N unit	.07	.07½	.07	.07½	.07	.07½	.07½	.07
tanks wks...S unit	.008	.01	.008	.01	.008	.01	.01	.008
Monochloroacetic, tech bbl...lb.	.20	.30	.20	.30	.20	.30	.30	.18
Monosulfonic, bbls...lb.	1.65	1.70	1.65	1.70	1.65	1.70	1.70	1.65
Muriatic, 18 deg, 120 lb cbys c-1 wks...100 lb.	.....	1.35	.....	1.35	.....	1.35	1.35	1.35
tanks, wks. 100 lb.	.....	1.00	.....	1.00	.....	1.00	1.00	1.00
20 degrees, cbys wks...100 lb.	.....	1.45	.....	1.45	.....	1.45	....	1.45
N & W, 250 lb bbls...	.85	.95	.85	.95	.85	.95	.95	.85
Naphthionic, tech, 250 lb...	.60	.65	.60	.65	.60	.65	Nom.	.....
Nitric, 36 deg, 135 lb cbys c-wks...100 lb.	.....	5.00	.....	5.00	.....	5.00	5.00	5.00
40 deg, 135 lb cbys, c-1 wks...100 lb.	.....	6.00	.....	6.00	.....	6.00	6.00	6.00
Oxalic, 300 lb bbls wks NY...lb.	.11	.11½	.11	.11½	.10¾	.11½	.11¾	.11
Phosphoric 50%, U. S. P....lb.	.....	.14	.....	.14	.....	.14	.14	.14
Syrupy, USP, 70 lb drs...lb.	.....	.14	.....	.14	.....	.14	.14	.14
Commercial, tanks,...Unit.	.....	.80	.....	.80	.....	.80	.80	.80
Picramic, 300 lb bbls...lb.	.65	.70	.65	.70	.65	.70	.70	.65
Picric, kegs...lb.	.30	.50	.30	.50	.30	.50	.50	.30
Pyrogallic, crystals...lb.	1.50	1.60	1.50	1.60	1.50	1.60	1.60	1.30
Salicylic, tech, 125 lb bbl...lb.	.33	.37	.33	.37	.33	.37	.37	.33
Sulfanilic, 250 lb bbls...lb.	.14½	.15	.14½	.16	.15	.16	.16	.15
Sulfuric, 66 deg, 180 lb cbys lc-1 wks...100 lb.	1.60	1.95	1.60	1.95	1.60	1.95	1.95	1.60
tanks, wks. ton	.....	15.00	.....	15.00	.....	15.00	15.50	15.00
1500 lb dr wks...100 lb.	1.50	1.65	1.50	1.65	1.65	1.50	1.65	1.50
60°, 1500 lb dr wks...100 lb.	1.27½	1.42½	1.27½	1.42½	1.42½	1.27½	1.42½	1.27½

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - March 1932 $1.59

	1930 Pounds	1930 Value
St. Lawrence	19,386,104	$1,267,267
Buffalo	2,016,931	177,563
New York	78,349	10,130
Michigan	895,620	43,454
Vermont	....	....
Total	23,377,004	$1,498,414

	1931 Pounds	1931 Value
St. Lawrence	10,594,450	$518,165
Buffalo,	3,055,180	214,473
New York	......	......
Michigan	1,572,320	65,297
Vermont	69,580	4,871
Total	15,291,530	$802,806

Acid Boric —A sudden decline of large proportions was announced in the prices for both borax and boric acid on March 22-23. The former price of $125 a ton for boric acid was radically reduced to the schedule given below:

	Contract-carload (delivered) Granular	Contract-carload (delivered) Powdered
Acid Boric, 99½+%		
bags, per lb.	.04	.042½
bbls. per lb.	.045	.047½

	Single carload (delivered) Granular	Single carload (delivered) Powdered
Acid Boric, 99½+%		
bags, per lb.	.042½	.045
bbls. per lb.	.047½	.05

Further details of this important price announcement will be found under borax.

Acid Chromic — Some slight improvement was reported in the demand from Detroit and other automobile centers and further improvement is anticipated in the next few weeks as production schedules are speeded up. Prices remain firm at present levels.

Acid Citric — A sharp reduction was placed in effect during the month bringing the current quotation down to 32c, a reduction of 1½c. Shipments of citric acid from Hawaii to the United States during 1931, shown separately for the first time, amounted to 515,177 pounds, valued at $158,486.

Acid Nitric — Prices remained firm despite the generally curtailed operations in large consuming industries.

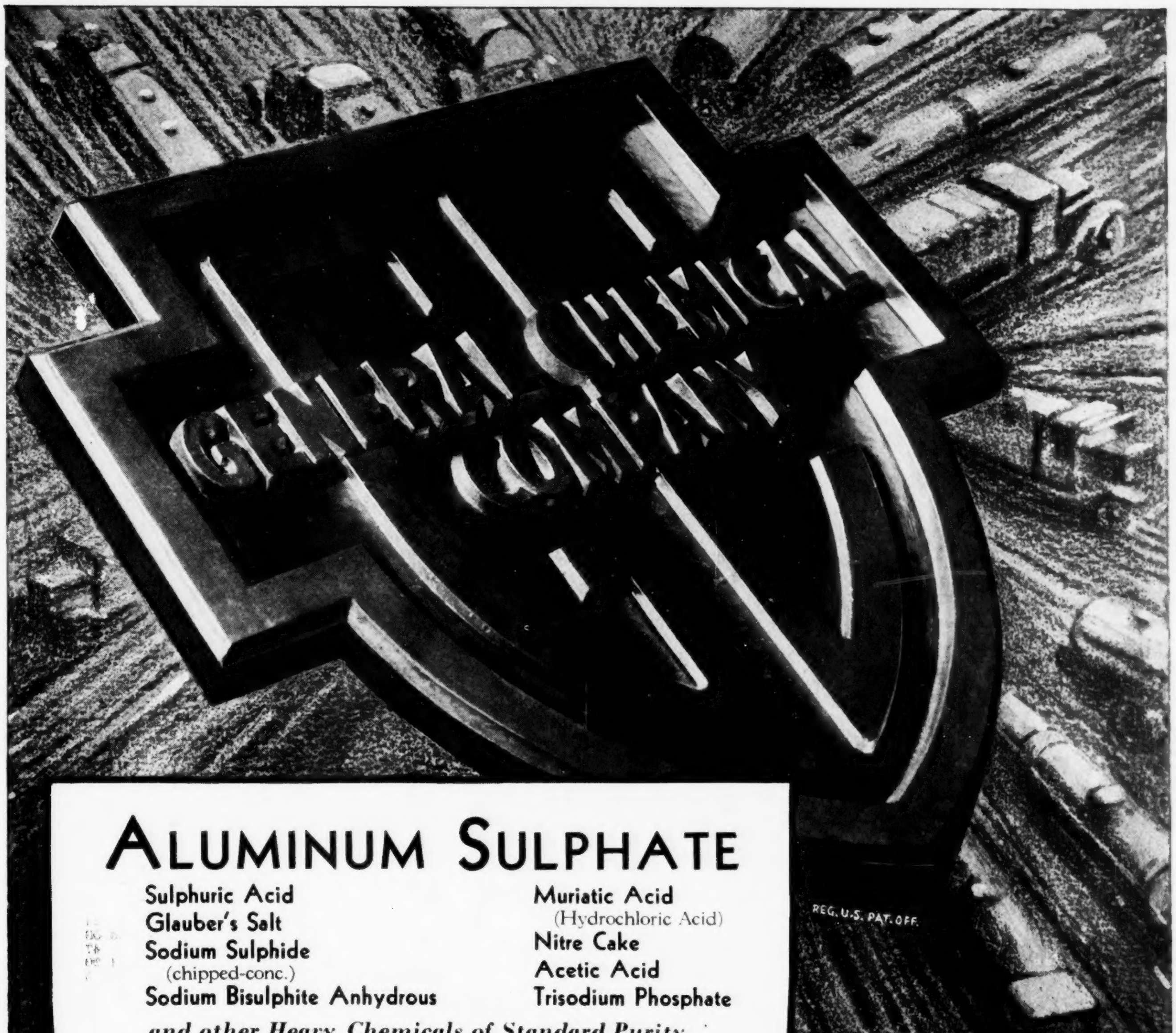
Acid Tartaric — Importers lowered prices in competition with domestic material, the new price being 24½c. During the first nine months of 1931 Italy exported tartaric acid and tartaric materials as follows: Tartaric acid 1,801 metric tons; cream of tartar, 715 tons; argols, 7,256 tons; and wine lees, 960 tons. The tartaric acid shipments went chiefly to Great Britain (333 tons), France (229), Argentina (146), Switzerland (126), Japan (118), and the United States (108). Most of the cream of tartar exports went to Great Britain (459) tons.

Acetanilide — Producers announced a reduction of 1c bringing the current price down to 22c-23c.

Alcohol — The new schedule was released on April 1 and shows very little difference from those prevailing for the

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Oleum, 20%, 1500 lb. drs 1c-1 wks ....ton	.....	18 50	.....	18.50	.....	18.50	18 50	18 50
40%, 1c-1 wks net ....ton	....	42 00	.....	42.00	.....	42.00	42 00	42 00
Tannic, tech, 300 lb bbls...lb.	.23	40	.23	.40	23	.40	.40	.23
Tartaric, USP, gran. powd, 300 lb. bbls....lb	.....	.24½	.24½	.25½	.25½	.29½	.38½	.33
Tobias, 250 lb bbls....lb.	.80	85	.80	.85	.80	.85	85	85
Trichloroacetic bottles....lb.	.....	2.75	.....	2.75	.....	2.75	2 75	2 75
Kegs....lb.	.....	2 00	.....	2.00	.....	2.00	2 00	2 00
Tungstic, bbls....lb.	1.40	1.70	1.40	1.70	1.40	1.70	1 70	1 40
Albumen, blood, 225 lb bbls..lb.	.38	.40	.38	.40	.38	.40	.40	38
dark, ...bbls., lb.	.12	.20	.12	.20	12	20	20	12
Egg, edible....lb.	.84	.87	.75	.90	.55	60	.75	55
Technical, 200 lb cases..lb.	.62	.66	.62	.66	.48	.66	73	.50
Vegetable, edible....lb.	.60	65	.60	.65	.60	.65	65	60
Technical....lb.	.50	.55	.50	.55	50	.55	55	50
Alcohol								
Alcohol Butyl, Normal, 50 gal drs c-1 wks....lb.	.1495	.1595	.1495	.1595	.1495	.17¼	.18¼	.17¼
Drums, 1-c-1 wks....lb.	.1545	.1645	.1545	.1645	.1545	.17¾	.18¾	.17¾
Tank cars wks....lb.	.....	.143	.....	.143	.143	.16¾	.17¾	.16¾
Amyl (from pentane) Tanks wks....lb.	.....	203	.....	.203	203	.236	.236	.236
Diacetone, 50 gal drs del..gal.	1.42	1.60	1.42	1.60	1.42	1.60	1.60	1.42
Ethyl, USP, 190 pf, 50 gal bbls....gal.	2.55	2.65	2.55	2.65	2.37	2.75	2 75	2.63
Anhydrous, drums....gal.	.54	.58	.54	.58	54	.60	.71	.56
No. 5,*188 pf, 50 gal drs. drums extra....gal.	.....	.34½	.....	.34½	.27	.44	50	.40
*Tank, cars....gal.	.....	.30½	.....	30½	.24	.38	.48	.37
Isopropyl, ref, gal drs....gal.	.60	.65	.60	.65	.60	1.00	1 00	60
Propyl Normal, 50 gal dr..gal.	.....	1.00	.....	1.00	.....	1.00	1 00	1.00
Alcotate, tanks....gal.	.....	.60	.....	.60	.60	.60	.....	.....
Aldehyde Ammonia, 100 gal dr lb.	.80	.82	.80	.82	.80	.82	.82	.80
Alpha-Naphthol, crude, 300 lb bbls....lb.	.57	.58	.57	.65	.60	.65	.65	.60
Alpha-Naphthylamine, 350 lb bbls....lb.	.32	.34	.32	.34	32	.34	.34	.32
Alum Ammonia, lump, 400 lb bbls, 1c-1 wks....100 lb.	3.00	3.25	3.00	3.25	3.00	3.50	3.50	3.20
Chrome, 500 lb casks, wks ....100 lb.	4.50	5.25	4.50	5.25	4.50	5.25	5.25	4.50
Potash, lump, 400 lb casks wks....100 lb.	3.00	3.50	3.00	3.50	3.00	3.50	3 50	3.10
Soda, ground, 400 lb bbls wks....100 lb.	3.50	3.75	3.50	3.75	3.50	3.75	3 75	3.50
Aluminum Metal, c-1 NY.100 lb.	22.90	24.30	22.90	24.30	22.90	24.30	24.30	24.30
Chloride Anhydrous,....lb.	.05	.09	.05	.09	.05	.09	.15	.05
Hydrate, 96%, light, 90 lb bbls....lb.	.16	.17	.16	.17	.16	.17	.18	.16
Stearate, 100 lb bbls....lb.	.20	.21	.20	.21	.18	.22	.26	.1
Sulfate, Iron, free, bags c-1 wks....100 lb.	1.90	1.95	1.90	1.95	1.90	1.95	2 05	1 9
Coml, bags c-1 wks..100 lb.	1.25	1.30	1.25	1.30	1.25	1.30	1 40	1.25
Aminoazobenzene, 110 lb kegs lb.	.....	1.15	.....	1.15	.....	1.15	1.15	1 15
Ammonium								
Ammonia anhydrous Com. tanks	.....	.05¾	.....	.05¾	.....	.05¾	.05¾	.05¾
Ammonia, anhyd, 100 lb cyl..lb.	.15½	.15½	.15½	.15½	.15½	.15½	.15½	15½
Water, 26°, 800 lb dr del...lb.	.02¾	.03	.02¾	.03	.02¾	.03¼	.03¼	03¼
Ammonia, aqua 26° tanks....	.....	.02¼	.....	.02¼	.02½	.02¾	.02¾	.02½
Acetate....lb.	.28	.39	.28	.39	.28	.39	.39	.28
Bicarbonate, bbls., f.o.b. plant ....100 lb.	.....	5.15	.....	5.15	.....	5.15	5 15	5 15
Bifluoride, 300 lb bbls....lb.	.21	.22	.21	.22	.21	.22	22	.21
Carbonate, tech, 500 lb cs..lb.	.10½	.12	.10½	.12	.09	.12	12	09
Chloride, white, 100 lb. bbls wks....100 lb.	4.45	5.15	4.45	5.15	4.45	5.15	5 15	4 45
Gray, 250 lb bbls wks....lb.	5.25	5.75	5.25	5.75	5.25	5.75	5.75	5 25
Lump, 500 lb cks spot...lb.	.11	.11½	.11	.11½	.11	.11½	11½	11
Lactate, 500 lb bbls....lb.	.15	.16	.15	.16	.15	.16	.16	15
Ammonium Linoleate....lb.	.15	.15	.15	.15	.15	.....	.....	....
Nitrate, tech, casks....lb.	06	.10	.06	.10	06	10	.10	.06
Persulfate, 112 lb kegs....lb.	.25	.27½	.25	.27½	.25	.30	.30	.26
Phosphate, tech, powd, 325 lb bbls....lb.	.11½	.12	.11½	.12	.11½	.12	.13	11½
Sulfate, bulk c-1....100 lb.	.....	1.10	1.05	1.10	1.10	1.80	2 10	1.75
Southern points....100 lb.	.....	1.25	.....	1.25	1.25	1.75	2.10	1.32½
Nitrate, 26% nitrogen 31.6% ammonia imported bags c. i. f....ton	34.60	35.00	34.60	35.00	34.60	35.00	57 60	45.00
Sulfocyanide, kegs....lb.	.36	.48	.36	.48	.36	.48	.48	36
Amyl Acetate, (from pentane) Tanks....lb.	.....	.17½	.....	.17½	.16	.222	.236	222
Tech., drs....lb.	.17½	.18	.17½	.18	.16½	.236	.24	.225
Alcohol, see Fusel Oil........								
Furoate, 1 lb tins....lb.		5.00	.....	5.00	.....	5.00	5.00	5 00
Aniline Oil, 960 lb drs....lb.	.14½	.16	.14½	.16	.14½	.16	.16	.15
Annatto, fine....lb.	.34	.37	.34	.37	.34	.37	.37	.34
Anthraquinone, sublimed, 125 lb bbls....lb.	.50	.55	.50	.55	.50	.55	.90	.50
Antimony, metal slabs, ton lots ....lb.	.....	.06½	.05¾	.06½	.06½	.07½	.09½	06½
Needle, powd, 100 lb cs....lb.	.08½	.09	.08½	.09	.08½	.09	09½	.08
Chloride, soln (butter of) cbys....lb.	.13	.17	.13	.17	.13	.17	.17	13
Oxide, 500 lb bbls....lb.	.08½	.08¾	.08½	.08¾	.08½	.08¾	08¾	.07½
Salt, 66%, tins....lb.	.22	.24	.22	.24	.22	.24	.24	.22
Sulfuret, golden, bbls....lb.	.16	.20	.16	.20	.16	.20	20	16
Vermilion, bbls....lb.	.38	.42	.38	.42	.38	.42	42	38
Archil, conc, 600 lb bbls....lb.	.17	.19	.17	.19	.17	.19	19	17
Double, 600 lb bbls....lb.	.12	.14	.12	.14	.12	.14	.14	.12
Triple, 600 lb bbls....lb.	.12	.14	.12	.14	.12	.14	.14	.12
Argols, 80%, casks....lb.	.....	.18¾	.....	.18¾	.....	.18¾	.18¾	.18¾
Crude, 30%, casks....lb.	.07	.07½	.07	.07½	.07	.08	.08	.07¾

*New formula, prices delivered N. Y.; base price tanks .27½ producing points
*F. O. B. Producing Points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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - March 1932 $1.59

past three months. Consumption for anti-freeze was disappointing to producers but was aided by unsettled weather in in March. The weakness in prices on the part of second hands appeared to be corrected and prices were being firmly adhered to in most quarters. The schedule follows:

	Cents per gallons
C. D. No. 5, tanks	31.4
drums, car lots	35.6
5 to 19 drums	41.6
1 to 4 drums	43.6
barrels car lots	38.6
5 to 19 barrels	44.6
1 to 4 barrels	46.6
S. D. No. 1, tanks	30.4
drums, car lots	34.6
5 to 19 drums	40.6
1 to 4 drums	42.6
barrels, car lots	37.6
5 to 19 barrels	43.6
1 to 4 barrels	45.6

Aluminum Sulfate — Slight improvement in the movement of material into consuming channels was reported by leading producers. Further improvement is quite likely in the next sixty days for the account of water purification users. Prices were firmly held in the spot market. During the fiscal year ending March, 1931, Canada's imports of aluminum sulfate totaled 473,341 hundredweight (of 112 pounds) valued at $541,079. This represented a decline of 56,500 hundredweight and 76,600 from the corresponding period of the previous year but was above the three year average of about $500,000 in 1927, 1928, and 1929. In the fiscal year 1931, 418,000 hundredweight came from the United States.

Borax — A sweeping reduction in prices was placed in effect in the last ten days of the month. Production capacities have increased tremendously in the past year or two and producers are anxious to extend the use of borax in the industries already large consumers and also to find new outlets promising worthwhile tonnages. The present reduction should cause an increase in the amount consumed in the glass industry and also in the manufacture of vitreous enamel products. The new schedule follows:

Borax in Carloads of 40 Tons or More:

	Spot Car	
	Sacks	*Barrels*
Fine Granulated	$40.00	$50.00
Powdered	45.00	55.00
Crystal or Coarse Granulated	46.00	56.00
	Per Ton of 2000 Pounds Contract two cars or more	
	Sacks	*Barrels*
Fine Granulated	$36.00	$46.00
Powdered	41.00	51.00
Crystal or Coarse Granulated	42.00	52.00

Allowance of $2.50 per ton for shipments in bulk.

Borax in Less Carloads:

	Ton Lots	
Fine Granulated	$45.00	$55.00
Powdered	50.00	60.00
Crystal or Coarse Granulated	51.00	61.00
	Less Ton Lots	
Fine Granulated	$50.00	$60.00
Powdered	55.00	65.00
Crystal or Coarse Granulated	56.00	66.00

Carloads freight allowed to points in Eastern or Atlantic States.

Less Carloads ex-warehouse.

U. S. P. $15.00 per ton higher.

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Aroclors, wks....lb.	.20	.40	.20	.40	.20	.40	.40	.20
Arsenic, Red. 224 lb kegs, cs..lb.	.09⅜	.10	.09⅜	.10	.09⅜	.10	.11	.08¾
White, 112 lb kegs....lb.	.04	.05	.04	.05	.03¾	.05	.04½	.03¾
Asbestine, c-1 wks....ton	.....	15.00	.....	15.00	.....	15.00	15.00	15.00
Barium								
Barium Carbonate, 200 lb bags wks....ton	56.50	57.00	56.50	57.00	56.50	60.00	60.00	58.00
Chlorate, 112 lb kegs NY..lb.	.14	.15	.14	.15	.14	.15	.15	.14
Chloride, 600 lb bbl wks...ton	63.00	69.00	63.00	69.00	63.00	69.00	69.00	63.00
Dioxide, 88%, 690 lb drs...lb.	.12	.13	.12	.13	.12	.13	.13	.12
Hydrate, 500 lb bbls....lb.	.04¾	.05½	.04¾	.05½	.04¾	.05½	.05½	.04¾
Nitrate, 700 lb casks....lb.	.07¼	.08	.07¼	.08	.07¼	.08½	.08½	.07½
Barytes, Floated, 350 lb bbls wks....ton	23.00	24.00	23.00	24.00	23.00	24.00	24.00	23.00
Bauxite, bulk, mines....ton	5.00	6.00	5.00	6.00	5.00	8.00	8.00	5.00
Beeswax, Yellow, crude bags..lb.	.22	.24	.22	.24	.22	.31	.34	.24
Refined, cases....lb.	.25	.28	.25	.28	.25	.37	.38	.37
White, cases....lb.	.34	.36	.34	.36	.34	.36	.53	.34
Benzaldehyde, technical, 945 lb drums wks....lb.	.60	.65	.60	.65	.60	.65	.65	.60
Benzene								
Benzene, 90%, Industrial, 8000 gal tanks wks....gal.	.....	.20	.....	.20	.18	.21	.22	.21
Ind. Pure, tanks works....gal.	.....	.20	.....	.20	.18	.21	.22	.21
Benzidine Base, dry, 250 lb bbls....lb.	.65	.67	.65	.67	.65	.67	.74	.65
Benzoyl, Chloride, 500 lb drs.lb.	.45	.47	.45	.47	.45	.47	1.00	.45
Benzyl, Chloride, tech drs....lb.	.....	.30	.....	.30	.....	.30	.25	.25
Beta-Naphthol, 250 lb bbl wk.lb.	.....	.22	.....	.22	.22	.24	.24	.22
Naphthylamine, sublimed, 200 lb bbls....lb.	1.25	1.35	1.25	1.35	1.25	1.35	1.35	1.25
Tech, 200 lb bbls....lb.	.53	.58	.53	.58	.53	.65	.65	.53
Blanc Fixe, 400 lb bbls wks..ton	75.00	90.00	75.00	90.00	75.00	90.00	90.00	75.00
Bleaching Powder								
Bleaching Powder, 800 lb drs c-1 wks contract....100 lb.	1.75	2.00	1.75	2.00	1.75	2.35	2.35	2.00
Blood, Dried, fob, NY....Unit	1.50	1.60	1.50	1.90	1.65	3.00	3.90	3.00
Chicago....Unit	1.50	1.60	1.50	1.60	1.50	2.35	4.50	2.75
S. American shipt....Unit	.....	Nom.	.....	Nom.	2.00	3.20	4.10	3.15
Blues, Bronze Chinese Milori Prussian Soluble....lb.	.....	.35	.....	.35	.....	.35	.35	.35
Bone, raw, Chicago....ton	21.00	21.50	21.00	21.50	21.00	32.00	39.00	31.00
Bone, Ash, 100 lb kegs....lb.	.06	.07	.06	.07	.06	.07	.07	.06
Black, 200 lb bbls....lb.	.05½	.08½	.05½	.08½	.05½	.08½	.08½	.05½
Meal, 3% & 50%, Imp....ton	.....	21.00	.....	21.00	21.00	31.00	31.00	31.00
Borax, bags....lb.	.018	.02	.018	.03½	.02½	.03½	.03½	.02½
Bordeaux, Mixture, 16% pwd..lb.	.11½	.13	.11½	.13	.11½	.13	.14	.12
Paste, bbls....lb.	.11½	.13	.11½	.13	.11½	.13	.14	.12
Brazilwood, sticks, shpmt....lb.	26.00	28.00	26.00	28.00	26.00	28.00	28.00	26.00
Bromine, cases....lb.	.36	.43	.36	.43	.36	.43	.47	.38
Bronze, Aluminum, powd blk.lb.	.60	1.20	.60	1.20	.60	1.20	1.20	.60
Gold bulk....lb.	.55	1.25	.55	1.25	.55	1.25	1.25	.55
Butyl, Acetate, normal drs..lb.	.161	.166	.161	.166	.161	.175	.20	.17
Tank, wks....lb.	.....	.143	.....	.143	.143	.175	.186	.16
Aldehyde, 50 gal drs wks...lb.	.34	.36	.34	.36	.34	.44	.44	.34
Carbitol s ee Diethylene Glycol Mono (Butyl Ether)....	.....	.....	.....	.....	.....	.....	.....	.....
Cellosolve (see Ethylene glycol mono butyl ether)....								
Furoate, tech., 50 gal. dr., lb.	.....	.50	.....	.50	.....	.50	.50	.50
Propionate, drs....lb.	.22	.25	.22	.25	.22	.25	.27	.22
Stearate, 50 gal drs....lb.	.....	.25½	.....	.25½	.25	.30	.30	.25
Tartrate, drs....lb.	.55	.60	.55	.60	.55	.60	.60	.55
Cadmium, Sulfide, boxes....lb.	.65	.90	.65	.90	.65	.90	1.75	.90
Calcium								
Calcium, Acetate, 150 lb bags c-1....100 lb.	.....	2.50	2.00	2.50	.....	2.00	4.50	2.00
Arsenate, 100 lb bbls c-1 wks....lb.	.05½	.06	.05½	.06	.06	.09	.09	.07
Carbide, drs....lb.	.05	.06	.05	.06	.05	.06	.06	.05
Carbonate, tech, 100 lb bags c-1....lb.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-1 wks....ton	.....	21.00	.....	21.00	21.00	22.75	22.75	22.75
Solid, 650 lb drs c-1 fob wks ....ton	.....	18.00	.....	18.00	18.00	20.00	20.00	20.00
Nitrate, 100 lb bags....ton	34.00	35.00	34.00	35.00	34.00	43.00	43.00	40.00
Peroxide, 100 lb. drs....lb.	.....	1.25	.....	1.25	.....	1.25	1.25	1.25
Phosphate, tech, 450 lb bbls lb.	.08	.08¾	.08	.08¾	.08	.08¾	.08¾	.08
Stearate, 100 lb bbls....lb.	.17	.18	.17	.18	.17	.22	.26	.19
Calurea, bags S. points. c.i.f. ton	.....	88.65	.....	88.65	.....	88.65	88.65	88.65
Camwood, Bark, ground bbls..lb.	.....	.18	.....	.18	.....	.18	.18	.18
Candelilla Wax, bags....lb.	.....	.14	.....	.14	.13	.15	.20	.15
Carbitol, (See Diethylene Gycol Mono Ethyl Ether)....	.....	.....	.....	.....	.....	.....	.....	.....
Carbon, Decolorizing, 40 lb bags c-1....lb.	.08	.15	.08	.15	.08	.15	.15	.08
Black, 100-300 lb cases 1c-1 NY....lb.	.06	.12	.06	.12	.06	.12	.12	.06
Bisulfide, 500 lb drs 1c-1 NY....lb.	.05½	.06	.05½	.06	.05½	.06	.06	.05½
Dioxide, Liq. 20-25 lb cyl...lb.	.....	.06	.....	.06	.....	.06	.18	.06
Tetrachloride, 1400 lb drs delivered....lb.	.06½	.07	.06½	.07	.06½	.07	.07	.06½
Carnauba Wax, Flor, bags....lb.	.26	.28	.26	.28	.26	.28	.37	.28
No. 1 Yellow, bags....lb.	.21½	.22	.21½	.24	.23	.40	.33	.25
No. 2 N Country, bags....lb.	.14	.15	.14	.16	.15	.23	.27	.20
No. 2 Regular, bags....lb.	.21	.22	.21	.22	.21	.23	.30	.23
No. 3 N. C....lb.	.11	.12	.11	.12	.11	.11	.23	.16
No. 3 Chalky....lb.	.11	.12	.11	.12	.11	.13½	.23	.16
Casein, Standard, Domestic.... ground....lb.	.06½	.07	.06½	.07½	.06	.10	.15½	.09½

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - March 1932 $1.59

Calcium Acetate — With stocks on hand radically reduced producers announced an increase of 50c per hundred pounds. United States production of calcium acetate continued to decline in 1931, the total output amounting to 40,658,221 pounds, compared with 77,199,410 pounds in 1930 and 112,764,816 pounds in 1929. Since March, 1931, however, the large stocks have decreased steadily, amounting to 8,733,949 pounds on December 31, 1931, compared with 19,266,386 pounds at the end of 1930. No imports or crude calcium acetate were recorded in 1931 compared with 13,815,814 pounds in 1930. A more detailed review of this market may be found in the feature section of this issue.

Camphor — Reductions were made during the past month in the various grades of camphor, the decline in slabs amounting to 3c. In contrast with the synthetic camphor trade in 1930, involving several European sources, supplies for American consumption during 1931, totaling 1,798,000 pounds valued at $587,500, originated entirely in Germany. An Italian synthetic camphor manufacturing firm is reported to have reorganized and to be approaching a daily output of 2,000 kilos. It is expected that the Italian product will again enter export trade.

Chlorine — Little change in the situation in this market has occurred for several months. Some improvement is looked for shortly from water purification sources. The paper industry continues to lag. Prices are being firmly maintained.

Coal Tar Products — With the steel industry still in the doldrums coking operations were maintained at a very low rate. Estimated monthly consumption of coal in the manufacture of coke in February was placed at 2,885,682 tons as against 3,036,100 tons in January and 4,155,300 tons in February a year ago. February production of tar totaled 26,548,314 gallons as against 27,932,120 gallons in January and 38,248,760 gallons in February, 1931. February light oil production declined to 8,729,586 gallons from 9,290,466 gallons in January and 12,715,218 gallons in February a year ago. Output of ammonia sulfate or its equivalent in February was placed at 33,863 tons as against 35,629 tons in January and 48,762 tons in February, 1931. The quantity of by-product coke on hand at producers' plants at the end of February amounted to 3,839,000 tons, a decrease of 8.1 percent when compared with the amount in storage a year ago. Demand for benzol, solvent naphtha and most of the coal-tar chemicals declined in March. Shipments of toluene were larger however and producers report a shortage of materiai avail-

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Cellosolve (see Ethylene glycol mono ethyl ether).........								
Acetate (see Ethylene glycol mono ethyl ether acetate)..								
Celluloid, Scraps, Ivory cs... lb.	.13	.15	.13	.15	.13	.15	.20	.20
Shell, cases.............. lb.	.18	.20	.18	.20	.18	.20	.20	.18
Transparent, cases.. ..... lb.	.....	.15	.....	.15	.....	.15	.15	.15
Cellulose, Acetate, 50 lb kegs .lb.	.80	1.25	.80	1.25	.80	1.25	1.25	.80
Chalk, dropped, 175 lb bbls...lb.	.03	.03¾	.03	.03¾	.03	.03¾	.03¾	03
Precip, heavy, 560 lb cks...lb.	.02	.03½	.02	.03½	.02	.03½	.03½	.02
Light, 250 lb casks........lb.	.02½	.03½	.02½	.03½	.02½	.03½	.03½	.02½
Charcoal, Hardwood, lump, bulk wks...................bu.	.18	.19	.18	.19	.18	.19	.19	.18
Willow, powd, 100 lb bbl wks.....................lb.	.06	.06½	.06	.06½	.06	.06½	.06½	06
Wood, powd, 100 lb bbls...lb.	.04	.05	.04	.05	04	.05	.05	04
Chestnut, clarified bbls wks,..lb.	.01¾	.02	.01¾	.02	.01¾	.03	.03	.02½
25% tks wks.............lb.	.01¾	.02½	.01¾	.02½	.01¾	.02½	.02½	.01¾
Powd, 60%, 100 lb bgs wks.lb.	.....	.04½	.....	.04½	.....	.04½	.04½	.04½
Powd, decolorized bgs wks..lb.	.05½	.06	.05½	.06	.05½	06	.06	.05½
China Clay, lump, blk mines.ton	8.00	9.00	8.00	9.00	8.00	9.00	9.00	8.00
Powdered, bbls...........lb.	.01¾	.02	.01¾	.02	.01¾	.02	.02	.01¾
Pulverized, bbls wks......ton	10.00	12.00	10.00	12.00	10.00	12.00	12.00	10.00
Imported, lump, bulk.....ton	15.00	25.00	15.00	25.00	15.00	25.00	25.00	15.00
Powdered, bbls...........lb.	.01¾	.03	.01¾	.03	.01¾	.03	.03	.01¾
Chlorine								
Chlorine, cyls lc-1 wks contract ....lb.	.07	.08½	.07	.08½	.07	.08½	.08½	.07
cyls, cl wks,. contract ...lb.	.04	.04½	.04	.04½	.04	.04½	.04½	.04
Liq tank or multi-car lot cyls wks contract...........lb.	.01¾	.02½	.01¾	.02½	.01¾	.02½	.025	.01¾
Chlorobenzene, Mono, 100 lb. drs lc-1 wks............lb.	.10	.10½	.10	.10½	.10	.10½	.10½	.10
Chloroform, tech, 1000 lb drs..lb.	.15	.16	.15	.16	.15	.16	.16	.15
Chloropicrin, comml cyls.....lb.	1.00	1.35	1.00	1.35	1.00	1.35	1.35	1.00
Chrome, Green, CP.........lb.	.26	.29	.26	.29	.26	.29	.29	.26
Commercial..............lb.	.06½	.11	.06½	.11	.06½	.11	.11	.06½
Yellow..................lb.	.16	.18	.16	.18	.16	.18	.18	.16
Chromium, Acetate, 8% Chrome bbls....................lb.	.04¾	.05¾	.04¾	.05¾	.04¾	.05¾	.05¾	.04¾
20° soln, 400 lb bbls.....lb.	.....	.05½	.....	.05½	.....	.05½	.05½	.05½
Fluoride, powd, 400 lb bbl..lb.	.27	.28	.27	.28	27	.28	.28	.27
Oxide, green, bbls.........lb.	.34½	.35½	.34½	.35½	.34½	.35½	.35½	.34½
Coal tar, bbls..............bbl	10.00	10.50	10.00	10.50	10.00	10.50	10.50	10.00
Cobalt Oxide, black, bags....lb.	1.35	1.45	1.35	1.45	1.35	2.22	2.22	2.10
Cochineal, gray or black bag..lb.	.52	.57	.52	.57	.52	.57	1.01	.52
Teneriffe silver, bags.......lb.	.....	.57	.....	.57	.55	.57	.95	.54
Copper								
Copper, metal, electrol....100 lb.	.....	6.00	5.75	7.25	6.25	10.36	17.78	9.50
Carbonate, 400 lb bbls.....lb.	.08½	.16½	.08½	.16½	.08½	.16½	.21½	.08½
Chloride, 250 lb bbls.......lb.	.22	.25	.22	..25	.22	.25	.28	.22
Cyanide, 100 lb drs........lb.	.39	.40	.39	.40	.39	.42	.45	.41
Oxide, red, 100 lb bbls.....lb.	.15	.16	.15	.16	.15	.18	.32	.15½
Sub-acetate verdigris, 400 lb bbls.....................lb.	.18	.19	.18	.19	18	.19	.19	.18
Sulfate, bbls c-1 wks...100 lb.	.....	2.75	2.75	3.10	3.10	4.95	5.50	3.95
Copperas, crys and sugar bulk c-1 wks................ton	.....	14.50	.....	14.50	13.00	14.00	14.00	13.00
Cotton, Soluble, wet, 100 lb bbls....................lb.	.40	.42	.40	.42	.40	.42	.42	.40
Cottonseed, S. E. bulk c-1...ton	.....	26.50	.....	26.50	.....	26.50	.....	.....
Meal S. E. bulk..........ton	.....	.....	.....	.....	.....	.....	.....	.....
7% Amm., bags mills...ton	13.25	38.00	13.25	38.00	13.25	38.00	38.00	37.50
Cream Tartar, USP, 300 lb. bbls....................lb.	.19¼	.20¼	.19¼	.20¼	.20¼	.24½	.27	.24½
Creosote, USP, 42 lb cbys....lb.	.40	.42	.40	.42	.40	.42	.42	.40
Oil, Grade 1 tanks.......gal.	.11½	.12½	.11½	.12½	.11½	.14	.16	.15
Grade 2...............gal.	.10½	.11½	.10½	.11½	.10½	.12	.14	.13
Grade 3...............gal.	.10½	.11½	.10½	.11½	.10½	.12	.14	.13
Cresol, USP, drums.........lb.	.10½	.11	.10½	.11	.10½	.17	.17	.14
Crotonaldehyde, 50 gal dr....lb.	.32	.36	.32	.36	.32	.36	.36	.32
Cudbear, English............lb.	.16	.17	.16	.17	.16	.17	.17	.16
Cutch, Rangoon, 100 lb bales..lb.	.10	.12	.10	.12	.10	.13	.13	.11
Borneo, Solid, 100 lb bale..lb.	.05½	.07	.05½	.07	.05½	.08½	.08½	.06½
Cyanamide, bags c-1 frt allowed Ammonia unit.........	.	.97½	.....	.97½	.97½	.....	.....	.....
Dextrin, corn, 140 lb bags.100 lb.	3.59	3.67	3.59	3.67	3.47	4.02	4.82	4.42
White, 140 lb bags.....100 lb.	3.27	3.37	3.27	3.37	3.37	4.02	4.77	4.17
Potato, Yellow, 220 lb bgs..lb.	.08	.09	.08	.09	.08	.09	.09	.08
White, 220 lb bags lc-1....lb	.08	.09	.08	.09	.08	.09	.09	.08
Tapioca, 200 lb bags lc-1...lb.	.08¼	.08¾	.08¼	.08¾	.08¼	.08¾	.08½	.08
Diamylphthalate, drs wks...gal.	.....	3.80	.....	3.80	.....	3.80	3.80	3.80
Dianisidine, barrels.......lb.	2.35	2.70	2.35	2.70	2.35	2.70	2.70	2.35
Dibutylphthalate, wks.......lb.	.....	.23½	.228	.23½	.228	.28	.28	.24½
Dibutyltartrate, 50 gal drs...lb.	.29½	.31½	.29½	.31½	.29½	.31½	.31½	.29½
Dichloroethylether, 50 gal drs lb.	.....	.06	.....	.06	.....	.06	.07	.05
Dichloromethane, drs wks....lb.	.55	.65	.55	.65	.55	.65	.65	55
Diethylamine, 400 lb drs.....lb.	2.75	3.00	2.75	3.00	2.75	3.00	3.00	2.75
Diethylcarbonate, drs ......gal.	1.85	1.90	1.85	1.90	1.85	1.90	1.90	1.85
Diethylaniline, 850 lb drs.....lb.	.55	.60	.55	.60	.55	.60	.60	.55
Diethyleneglycol, drs........lb	.14	.16	.14	.16	.14	.16	.13	.10
Mono ethyl ether, drs....lb.	.15	.16	.15	.16	.15	.16	.16	.13
Mono butyl ether, drs... lb.	.24	.30	.24	.30	.24	.30	.30	.24
Diethylene oxide, 50 gal dr....lb.	.....	.50	.....	.50	.....	.50	.50	.50
Diethylorthotoluidin, drs.....lb.	.64	.67	.64	.67	.64	.67	.67	.64
Diethyl phthalate, 1000 lb drums.................lb.	.23	.26	.23	.26	.23	.26	.26	.24
Diethylsulfate, technical, 50 gal drums.................lb.	.30	.35	.30	.35	.30	.35	.35	.30
Dimethylamine, 400 lb drs...lb.	....	2.62	.....	2.62	.....	2.62	2.62	2.62
Dimethylaniline, 340 lb drs...lb.	.25	27	.25	.27	.25	.28	.28	.26

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - March 1932 $1.59

able for immediate shipment. Prices were well sustained on practically all members of the group.

Copperas — With little or no real improvement being registered in the steel industries the firm position of this commodity remains unaltered despite lowered demand from the textile industry.

Copper Sulfate — Shipments are showing further improvement in anticipation of the domestic agricultural season. The present low price is based on 5c copper and with the metal selling one cent higher, the general belief in the market was that a rise was imminent, providing the metal market showed further signs of stability even at present levels.

Creosote Oil — Wood treating grades were in better demand, but the serious decline in the purchasing power of the railroads has been felt in this industry. The Tariff Commission released during the month its report on creosote oil, suggesting the inadvisability at this time of adding a duty.

Fertilizer Materials — The market in the past month was marked by striking inactivity on the part of mixers. The uncertainty surrounding the possible tonnages for the coming season has led producers to hold withdrawals to relatively small quantities. According to a special tabulation arranged by The National Fertilizer Association from the records of the Bureau of Foreign and Domestic Commerce, imports of fertilizer and fertilizer materials during February were only 60 per cent of those for February, 1931 and 66 per cent of those for February, 1930. Exports for February were 94 per cent of those for February, 1931 and 60 per cent of those for February, 1930. Imports of all materials during February were smaller than a year ago with the exception of ammonium sulfate, bone phosphates, superphosphate, other phosphates, kainite and manure salts. Imports of sodium nitrate were the smallest for February in many years, as shown by the table below:

	Tons
February, 1927	37,474
February, 1928	144,716
February, 1929	146,304
February, 1930	85,837
February, 1931	68,421
February, 1932	8,404

Amonium sulfate imports for February totaled more than 19,000 tons, compared with 4,900 tons for February, 1931 and only 392 tons for February, 1930. While there were noticeable declines in the amount of the exports of phosphate rock, superphosphate and many other fertilizer materials, there was a pronounced increase in the exports of "other nitrogenous chemicals" during February. The classi-

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Dimethylsulfate, 100 lb drs...lb.	.45	.50	.45	.50	.45	.50	.50	.45
Dinitrobenzene, 400 lb bbls...lb.	.15	.16	.15	.16	.15	.16½	.16½	.15½
Dintrochlorobenzene, 400 lb bbls....lb.	.13	.15	.13	.15	.13	.15	.15	.13
Dinitronaphthalene, 350 lb bbls ....lb.	.34	.37	.34	.37	.34	.37	.37	.34
Dinitrophenol, 350 lb bbls....lb.	.23	.24	.23	.24	.29	.30	.32	.31
Dinitrotoluene, 300 lb bbls...lb.	.16	.17	.16	.17	.16	.17	.18	.16
Diorthotolyguanidine, 275 lb bbls wks....lb.	.42	.46	.42	.46	.42	.46	.46	.42
Dioxan (See Diethylene Oxide)	.....	.....	.....	.....	.....	.....	...	.....
Diphenyl....lb.	.20	.40	.20	.40	.20	.40	.50	.20
Diphenylamine....lb.	.34	.37	.34	.37	.37	.38	.40	.38
Diphenylguanidine, 100 lb bbl lb.	.30	.35	.30	.35	.30	.35	.35	.30
Dip Oil, 25%, drums....lb.	.26	.30	.26	.30	.26	.30	.30	.26
Divi Divi pods, bgs shipmt..ton	28.00	29.00	28.00	30.00	28.00	35.00	46.50	35.00
Extract....lb.	.05	.05½	.05	.05½	.05	.05½	.05½	.05
Egg Yolk, 200 lb cases....lb.	.49	.51	.49	.52	.45	.58	.80	.72
Epsom Salt, tech, 300 lb bbls c-1 NY........100 lb.	1.70	1.90	1.70	1.90	1.70	1.90	1.90	1.70
Ether, USP anaesthesia 55 lb. drs. ....lb.	.....	.23	.....	.23	.23	.28	.28	.21
USP (Conc.)....lb.	.09	.10	.09	.10	.09	.10	.....	.....
Ethyl Acetate, 85% Ester, ... tanks....lb.	.....	.09	.....	.09	.06½	.09	.115	.085
drums....lb.	.....	.10	.....	.10	.08	.10	.158	.094
Anhydrous, tanks....lb.	.....	.10	.....	.10	.075	.119	.142	.119
drums....lb.	.....	.10½	.....	.10½	.085	.121	.156	.115
Acetoacetate, 50 gal drs....lb.	.65	.68	.65	.68	.65	.68	.68	.65
Benzylaniline, 300 lb drs...lb.	.88	.90	.88	.90	.88	.90	1.11	.88
Bromide, tech, drums....lb.	.50	.55	.50	.55	.50	.55	.55	.50
Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.85	1.90	1.85	1.90	1.90	1.85
Chloride, 200 lb. drums....lb.	.....	.22	.....	.22	.....	.22	.22	.22
Chlorocarbonate, cbys....lb.	.....	.30	.....	.30	.....	.30	.40	.30
Ether, Absolute, 50 gal drs..lb.	.50	.52	.50	.52	.50	.52	.52	.50
Furoate, 1 lb tins....lb.	.....	5.00	.....	5.00	.....	5.00	5.00	5.00
Lactate, drums works....lb.	.25	.29	.25	.29	.25	.29	.29	.25
Methyl Ketone, 50 gal drs..lb.	.....	.30	.....	.30	.....	.30	.30	.30
Oxalate, drums works....lb.	.45	.55	.45	.55	.45	.55	.55	.45
Oxybutyrate, 50 gal drs wks.lb.	.....	.30½	.....	.30½	.....	.30½	.30½	.30½
Ethylene Dibromide, 60 lb dr .lb.	.....	.70	.....	.70	.....	.70	.70	.70
Chlorhydrin, 40%, 10 gal cbys. chloro. cont....lb.	.75	.85	.75	.85	.75	.85	.85	.75
Dichloride, 50 gal drums...lb.	.05	.07	.05	.07	.05	.07	.07	.05
Glycol, 50 gal drs wks....lb.	.25	.28	.25	.28	.25	.28	.28	.25
Mono Butyl Ether drs wks.	.....	.24	.....	.24	.24	.27	.27	.23
Mono Ethyl Ether drs wks	.17	.20	.17	.20	.17	.20	.20	.16
Mono Ethyl Ether Acetate dr. wks....	.19½	.23	.19½	.23	.19½	.23	.23	.19
Mono Methyl Ether, drs.lb.	.21	.23	.21	.23	.21	.23	.23	.19
Stearate....	.18	.18	.18	.18	.18	.18	.....	.....
Oxide, cyl....lb.	.....	2.00	.....	2.00	.....	2.00	2.00	2.00
Ethylidenaniline....lb.	.45	.47½	.45	.47½	.45	.47½	.47½	.45
Feldspar, bulk....ton	15.00	20.00	15.00	20.00	15.00	20.00	25.00	15.00
Powdered, bulk works....ton	15.00	21.00	15.00	21.00	15.00	21.00	21.00	15.00
Ferric Chloride, tech, crystal 475 lb bbls....lb.	.05	.07½	.05	.07½	.05	.07½	.07½	.05
Fish Scrap, dried, wks....unit	.....	3.00&10	.....	3.00&10	3.00&10	4.25&10	4.35&10	3.90&10
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	2.40&50	.....	2.40&50	.....	2.40&50	3.50&50	3.20&50
Fluorspar, 98%, bags....	41.00	46.00	41.00	46.00	41.00	46.00	46.00	41.00
Formaldehyde								
Formaldehyde, aniline, 100 lb.	.....	.....	.....	.....	.....	....	.....	.....
drums....lb.	.37½	.42	.37½	.42	.37½	.42	.42	.37½
USP, 400 lb bbls wks....lb.	.06	.07¾	.06	.07¾	.06	.07¾	.08	.06
Fossil Flour....lb.	.02½	.04	.02½	.04	.02½	.04	.04	.02½
Fullers Earth, bulk, mines ..ton	15.00	20.00	15.00	20.00	15.00	20.00	20.00	15.00
Imp. powd c-1 bags....ton	24.00	30.00	24.00	30.00	24.00	30.00	30.00	24.00
Furfural (tech.) drums, wks..lb.	.....	.10	.....	.10	.....	.10	.15	.10
Furfuramide (tech) 100 lb dr..lb.	.....	.30	.....	.30	.....	.30	.30	.30
Furfuryl Acetate, 1 lb tins....lb.	.....	5.00	.....	5.00	.....	5.00	5.00	5.00
Alcohol, (tech) 100 lb dr....lb.	.....	.50	.....	.50	.....	.50	.50	.50
Furoic Acid (tech) 100 lb dr...lb.	.....	.50	.....	.50	.....	.50	.50	.50
Fusel Oil, 10% impurities ...gal.	.. ..	1.35	.....	1.35	.....	1.35	1.35	1.35
Fustic, chips....lb.	.04	.05	.04	.05	.04	.05	.05	.04
Crystals, 100 lb boxes....lb.	.18	.20	.18	.20	.18	.22	.22	.20
Liquid, 50°, 600 lb bbls....lb.	.07	.08	.07	.08	.07	.10	.10	.09
Solid, 50 lb boxes....lb.	.14	.16	.14	.16	.14	.16	.16	.14
Sticks....ton	25.00	26.00	25.00	26.00	25.00	26.00	26.00	25.00
G Salt paste, 360 lb bbls....lb.	.45	.50	.45	.50	.45	.50	.50	.45
Gall Extract....lb.	.18	.20	.18	.20	.18	.20	.20	.18
Gambier, common 200 lb cs. .lb.	.....	.07	.....	.07	.06½	.07	.07	.06
25% liquid. 450 lb bbls....lb.	.08	10	.08	.10	.08	.10	.10	.08
Singapore cubes, 150 lb bg..lb.	.09½	.09	.09½	.09	.09½	.09	.09	.08½
Gelatin, tech, 100 lb cases....lb.	.45	50	.45	.50	.45	.50	.50	.45
Glauber s Salt, tech, c-1 wks....100 lb.	1.00	1.70	1.00	1.70	1.00	1.70	1.70	1.00
Glucose (grape sugar) dry 70-80° bags c-1 NY....100 lb.	3.24	3.34	3.24	3.34	3.24	3.34	3.34	3.24
Tanner's Special, 100 lb bags ....100 lb.	.....	3.14	.....	3.14	.....	3.14	3.14	3.14
Glue, medium white, bbls ...lb.	.16	.20	.16	.20	.16	.24	.24	.20
Pure white, bbls....lb.	.20	.25	.20	.25	.20	.26	.26	.22
Glycerin, CP, 550 lb drs....lb.	.10¼	.10½	.10¼	.11½	.11½	.14½	.14½	.12½
Dynamite, 100 lb drs....lb.	.08	.08½	.08	.09¾	.09	.12¼	.12¼	.11
Saponification, tanks....lb.	.05	.06	.05	.06¼	.06	.07½	.08	.07½
Soap Lye, tanks....lb.	.04	.04¼	.04	.05	.04¾	.07	.07½	.06¾
Graphite, crude, 220 lb bgs...ton	15.00	35.00	15.00	35.00	15.00	35.00	35.00	15.00
Flake, 500 lb bbls....lb.	.06	09	.06	.09	.06	.09	.09	.06
Gums								
Gum Accroides, Red, coarse and fine 140-150 lb bags....lb.	.03¾	04½	.03¾	.04½	.03¾	.04½	.04½	.03¾
Powd, 150 lb bags....lb.	.06	06½	.06	.06½	.06	.06½	.06½	.06

METHANOL ★ ACETIC ACID

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Vast hardwood forests covering many square miles in parts of two states . . . a distillation plant laid out to consume 200 cords of wood per day . . . constant supplies of natural gas and artesian water on our own properties . . . prestige achieved through 50 years' operation as one of the South's largest lumber producers . . . financial scope and stability built up through capable, conservative management . . . *These* are the basic factors in Crossett's unique advantages in achieving mass production in the distillation of Methanol and Acetic Acid, and the making of charcoal.

Correspondence invited

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ALSO: RAILWAY EXCHANGE BUILDING, CHICAGO

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A Sensitive Reagent for Aldehydes

1259
DIMETHYL-
DIHYDRORESORCINOL

A SIMPLE but reliable test for aldehydes through the formation of condensation products with dimethyldihydroresorcinol is described in a recent article by Weinberger in INDUSTRIAL AND ENGINEERING CHEMISTRY *3*, 365 (1931).

The presence of ketones does not interfere. The condensation products are definite, easily crystallizable compounds which may be identified by their melting points.

Further details of this method will be supplied on request.

■

EASTMAN KODAK COMPANY

Chemical Sales Dept. Rochester, N. Y.

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - March 1932 $1.59

fication "other nitrogenous chemicals" includes *sodium nitrate,* calcium nitrate and other fertilizers. During February the total exports for this classification amounted to 29,632 tons, against 5,557 tons for February, 1931 and 1,711 tons for February, 1930. Apparently shipment was made of the reported order of the sale of 25,000 tons of domestic sodium nitrate to France. Details of the imports and exports for February, in comparison with February, 1931 and February, 1930, are shown in the table on the following page.

Imports

	February 1932	1931	1930
Calcium cyanamide	6,252	8,341	24,043
Calcium nitrate	1,133	7,242	9,953
Sodium nitrate	8,404	68,421	85,837
Ammonm-sulfate-nitrate	....	133	1,007
Guano	24	2,454	1,664
Dried blood	425	839	636
Tankage	1,939	2,391	1,219
Ammonium sulfate	19,232	4,920	392
Urea and cal urea*	579	644	*....
Other nitrogenous	2,144	3,050	11,460
Total Nitrogenous Materials	40,132	98,435	136,211
Bone phosphates	3,698	3,652	6,811
Phosphate rock	.....	.....	.....
Superphosphate	568	.....	.....
All other phosphates	1,089	74	2,085
Total Phosphate Materials	5,355	3,726	8,896
Muriate of potash	6,313	11,455	30,057
Sulfate of potash	2,039	3,196	8,270
Kainite	7,846	6,956	18,883
Manure salts	19,484	12,209	48,918
Other potash	47	6	72
Total Potash Materials	35,729	33,822	106,200
Nitrophoska	421	1,329	2,742
Other fertilizers	2,523	4,109	3,547
Grand Total	84,160	141,421	257,596

Exports

	1932	1931	1930
Ammonium sulfate	2,237	12,177	10,882
Other nitrogenous chem.†	29,632	5,557	1,711
Nitrogenous organic waste††	245	602	††
Total Nitrogenous Materials	32,114	18,336	12,593
High grade hard rock	9,793	27	6,785
Land pebble rock	55,131	74,147	123,902
Total phosphate rock	64,924	74,174	130,687
Superphosphate	141	6,314	10,110
Other phosphate materials	197	208	.....
Total Phosphate Materials	65,262	80,696	140,797
Muriate of potash**	.....	1,420	**
Other potash**	54	242	**
Total Potash Materials	54	1,662	957**
Nitrog. phosphatic types‡	701	‡	‡
Nitrog. potassic types‡	.....	‡	‡
Nitrog. phosphatic-potassic types‡	.....	‡	‡
Total Concentrated Chemical Fertilizers‡	701	3,072‡	‡2,776
Prepared Fert. Mixt.	133	283	7,610
Grand Total	98,264	104,049	164,733

The latest revised figures appear in the above table. *Previously grouped with "other nitrogenous materials." **Prior to Jan. 1, 1931, all potash materials were consolidated. ‡Prior to Jan. 1, 1932 classified as "other fertilizers." †Includes sodium nitrate, calcium nitrate, urea, calcium cyanamide, ammonium sulfate nitrate, etc. ††Formerly classified as "other nitrogenous materials."

Glauber Salt — A slight decline in demand was noted in the textile processing

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Yellow, 150-200 lb bags....lb.	.18	.20	.18	.20	.18	.20	.20	.18
Animi (Zanzibar) bean & pea 250 lb cases....lb.	.35	.40	.35	.40	.35	.40	.40	.35
Glassy, 250 lb cases....lb.	.50	55	.50	.55	.50	.55	.55	.50
Asphaltum, Barbadoes (Manjak) 200 lb bags....lb.	.04½	.06	.04½	.06	.04½	.12	.12	.09
Egyptian, 200 lb cases....lb.	.13	.15	.13	.15	.13	.17	.17	.15
Gilsonite Selects, 200 lb bags ....ton	30.50	32.90	30.50	32.90	30.50	32.90	32.90	30.50
Damar Batavia standard 136, lb cases....lb.	.08½	.09	.08½	.09	.08½	.13	.20	.14
Batavia Dust, 160 lb bags....lb.	.05	.05½	.05	.05½	.05½	.06	.11	.06
E Seeds, 136 lb cases....lb.	.06	.06½	.06	.06½	.07	.08	.13	.08
F Splinters, 136 lb cases and bags....lb.	.05½	.06	.05½	.06	.06½	.07½	.13½	.07
Singapore, No 1, 224 lb cases lb.	.10½	.11	.10½	.11	.10½	.15	.24	.18½
No. 2, 224 lb cases....lb.	.07	.07½	.07	.07½	.07	.10	.20½	.13
No. 3, 180 lb bags....lb.	.04½	.05	.04½	.05	.05	.06	.11½	.07
Benzoin Sumatra, U. S. P. 120 lb cases....lb.	.21	.22	.21	.22	.23	.34	.40	.33
Copal Congo, 112 lb bags, clean opaque....lb.	.16½	.17	.16½	.17	.16	.17	.17	.16
Dark, amber....lb.	.06	.07	.06	.07	.06½	.07½	.08	.07¾
Light, amber....lb.	.08½	.09	.08	.09	.08	.14	.14	.12½
Water white....lb.	.37	.45	.37	.45	.37	.45	.45	.37
Mastic....lb.	.36	.37	.35	.37	.42	.58	.65	.57
Manila, 180-190 lb baskets								
Loba A....lb.	.10	.11	.10	.11	.11	.13	.17½	.13
Loba B....lb.	.08	.08½	.08	.08½	.09	.10½	.16½	.13½
Loba C....lb.	.07½	.08	.07½	.08	.08½	.10	.14	.10
M A Sorts....lb.	.04¾	.05	.04¾	.05	.04¾	.06½	.....	.....
D B B Chips....lb.	.05½	.06½	.05½	.06½	.05½	.08	.....	.....
East Indies chips, 180 lb bags lb.	.05	.05½	.05	.05½	.05	.05½	.11	.09
Pale bold, 224 lb cs....lb.	.15½	.16	.15½	.16	.15½	.16	.21	.17½
Pale nubs, 180 lb bags....lb.	.08	.08½	.08	.08½	.08	.09	.16	.12½
Pontianak, 224 lb cases....								
Bold gen No 1....lb.	.15½	.16	.15½	.16	.16	.17	.21	.19
Gen chips spot....lb.	.07	.08	.07	.08	.07	.08½	.15	.13½
Elemi, No. 1, 80-85 lb cs....lb.	.09	.09½	.09	.09½	.10	.12	.14	.12½
No. 2, 80-85 lb cases....lb.	.08½	.09	.08½	.09	.09½	.11½	.13½	.12
No. 3, 80-85 lb cases....lb.	.08	.08½	.08	.08½	.08½	.11	.13	.11
Kauri, 224-226 lb cases No. 1	43	.46	43	.46	.42	.50	.57	.48
No. 2 fair pale....lb.	.28	.30	.28	.30	.24	.29	.38	.32
Brown Chips, 224-226 lb cases....lb.	.10	.12	.10	.12	.10	.12	.12	.10
Bush Chips, 224-226 lb. cases....lb.	.26	.28	.26	.28	.28	.34	.40	.38
Pale Chips, 224-226 lb cases ....lb.	.19	21	.19	.21	.19	.22	.26	.24½
Sandarac, prime quality, 200 lb bags & 300 lb casks....lb.	.19½	.20	.19½	.20	.18	.22	.40	.27
Helium, 1 lit. bot....lit.	.....	25.00	.....	25.00	.....	25.00	25.00	25.00
Hematine crystals, 400 lb bbls lb.	.14	.18	.14	.18	.14	.18	.18	.14
Paste, 500 bbls....lb.	.....	.11	.....	.11	.....	.11	.11	.11
Hemlock 25%, 600 lb bbls wks lb.	.03	.03½	.03	.03½	.03	.03½	.03½	.03
Bark....ton	.....	16 00	.....	16.00	.....	16.00	16.00	16.00
Hexalene, 50 gal drs wks....lb.	.40	.50	.40	.50	.40	.60	.60	.60
Hexamethylenetetramine, drs .lb.	.46	.47	.46	.47	.46	.50	.50	.46
Hoof Meal, fob Chicago....unit	.....	1.35	.....	1.35	1.35	2.50	3.75	2.50
South Amer. to arrive....unit	.....	1.80	.....	1.80	1.80	2.70	3.75	2.70
Hydrogen Peroxide, 100 vol, 140 lb cbys....lb.	.21	.24	.21	.24	.21	.24	.26	.21
Hydroxyamine Hydrochloride lb.	.....	3.15	.....	3.15	.....	3.15	3.15	3.15
Hypernic, 51°, 600 lb bbls....lb.	.11	.12	.11	.12	.11	.15	.15	.12
Indigo Madras, bbls....lb.	1.25	1 30	1.25	1.30	1.25	1.30	1.30	1.28
20% paste, drums....lb.	.15	18	.15	.18	.15	.18	.18	.15
Synthetic, liquid....lb.	.....	.12	.....	.12	.....	.12	.12	.12
Iron Chloride, see Ferric or Ferrous								
Iron Nitrate, kegs....lb.	.09	.10	.09	.10	.09	.10	.10	.09
Coml, bbls....100 lb.	2.50	3.25	2.50	3.25	2.50	3.25	3.25	2.50
Oxide, English....lb.	.10	.12	.10	.12	.10	.12	.12	.10
Red, Spanish....lb.	.02½	.03½	.02½	.03½	.02½	.03½	.03½	.02½
Isopropyl Acetate, 50 gal drs gal.	.85	.90	.85	.90	.85	.90	.90	.85
Japan Wax, 224 lb cases....lb.	.08	.08½	.08	.09	.07¾	.11	.15½	.11½
Kieselguhr, 95 lb bgs NY.... Brown....ton	60.00	70.00	60.00	70.00	60.00	70.00	70.00	60.00
Lead Acetate, bbls wks...100 lb.	9.00	9.50	9.00	10.00	9.50	11.00	13.50	10.50
White crystals, 500 lb bbls wks....100 lb.	10.00	10.50	10.00	11.00	10.50	12.25	14.50	11.50
Arsenate, drs 1c-1 wks....lb.	.10	.13	.10	.13	.10	.14	.16	.13
Dithiofuroate, 100 lb dr....lb.	.....	1.00	.....	1.00	.....	1.00	1 00	1.00
Metal, c-1 NY....100 lb.	.....	3.25	3.25	3.75	3.75	4.60	7 75	5.10
Nitrate, 500 lb bbls wks....lb.	.12	.14	.12	.14	.12	.14	.14	.13
Oleate, bbls....lb.	.17½	.18	.17½	.18	.17½	.18	.18	.17½
Oxide Litharge, 500 lb bbls.lb.	.06½	.07	.06½	.07	.06¾	.08	.08¾	.08¾
Red, 500 lb bbls wks....lb.	.06¾	.07	.06¾	.07	.06¾	.08½	.09¾	.08¾
White, 500 lb bbls wks....lb.	.06½	.07	.06½	.07	.06½	.08	.09½	.07½
Sulfate, 500 lb bbls wk....lb.	.05¾	.06	.05¾	.06	.05¾	.07	.08¾	.06¾
Leuna saltpetre, bags c.i.f....ton	.....	Nom.	.....	Nom.	.....	57.60	57.60	57.60
S. points c. i. f....ton	.....	Nom.	.....	Nom.	.....	57.90	57.90	57.90
Lime, ground stone bags....ton	.....	4.50	.....	4.50	.....	4.50	4.50	4.50
Live, 325 lb bbls wks...100 lb.	.....	1.05	.....	1.05	.....	1.05	1.05	1.05
Lime Salts, see Calcium Salts								
Lime-Sulfur soln bbls....gal.	.15	.17	.15	.17	.15	.17	.17	.15
Lithopone, 400 lb bbls 1c-1 wks ....lb.	.04¾	.05	.04¾	.05	.04¾	.05	.05¾	.04¾
Logwood, 51°, 600 lb bbls....lb.	.07	.08	.07	.08	.07	.08	.08½	.07
Chips, 150 lb bags....lb.	.03	.03½	.03	.03½	.03	.03½	.03½	.03
Solid, 50 lb boxes....lb.	.12	.12½	.12	.12½	.12	.12½	.12½	.12½
Sticks....ton	24.00	26.00	24.00	26.00	24.00	26.00	26.00	24.00
Lower grades....lb.	.07½	.08	.07½	.08	.07½	.08	.08	.07½
Madder, Dutch....lb.	.22	.25	.22	.25	.22	.25	.25	.22
Magnesite, calc, 500 lb bbl...ton	50.00	60.00	50.00	60.00	50.00	60.00	60.00	50.00

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - March 1932 $1.59

centers as activity in this branch of industry dropped from the February level.

Glycerine — All grades, including c. p. went into new low ground during the past month. Stocks are still accumulating and with the disappointing winter season the outlook was far from being satisfactory from the producers' viewpoint.

Lead — The price of the metal declined further during March and the spot price N. Y. was quoted as the month closed at $3.00, a loss of 20 points from February. Recoverable lead in ore received by smelters in the United States in February amounted to 29,439 short tons, compared with 31,869 tons in January and 32,416 tons in December, according to the American Bureau of Metal Statistics. Of the receipts in February 29,086 tons were in domestic ore and 353 tons were from foreign countries. In February, 1931, receipts of recoverable lead amounted to 36,744 tons, of which 35,512 tons were domestic and 1,232 tons were foreign ore. Receipts of lead in scrap and secondary materials in February totaled 4,095 tons, compared with 3,047 tons in January and 2,249 tons in February.

Mercury — The market for this commodity underwent further strengthening in March and current quotations for small quantities was reported around $74-$75 a flask of 76 pounds.

Methanol — With alcohol producers renewing the schedule of the past three months, the price of methanol appeared unlikely to change in the near future. The demand for anti-freeze purposes was disappointing in common with all anti-freeze materials. United States production of methanol during 1931 declined sharply. The refined wood distillation output of 1,718,826 gallons in 1931 declined about 64 per cent compared to 4,858,755 gallons in 1930. Crude methanol fell to 3,235,113 gallons in 1931, considerably below the figure of 4,735,489 gallons in 1930 while synthetic methanol showed a smaller decrease to 7,007,332 gallons in 1931 from 7,589,227 gallons in 1930. Stocks of wood distillation refined methanol were lower on Dec. 31, 1931, than at the end of any other month since Sept., 1928. Stocks of synthetic and crude methanol at the end of the year, however, still remained above the level of 1930.

Napthalene — Seasonal buying was in evidence in the last part of the month. Both crude and refined prices were strongly held at former levels.

Potash — Fertilizer mixers are showing a decided disinclination to carry large stocks ahead with the result that imports and domestic sales are slow. The German Potash Syndicate has discontinued the publication of the monthly sales statistics,

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Magnesium								
Magnesium Carb, tech, 70 lb bags NY.....lb.	06	06½	.06	.06½	.06	.06½	.06½	.06
Chloride flake, 375 lb. drs c-l wks.....ton	35.00	36.00	35.00	36.00	35.00	36.00	36.00	36.00
Imported shipment.....ton	31.75	33.00	31.75	33.00	31.75	33.00	33.00	31.75
Fused, imp, 900 lb bbls NY ton	.....	31.00	.....	31.00	.....	31.00	31.00	31.00
Fluosilicate, crys, 400 lb bbls wks.....lb.	.10	.10½	.10	.10½	.10	.10½	.10½	.10
Oxide, USP, light, 100 lb bbls .....lb.	.....	.42	.....	.42	.....	.42	.42	.42
Heavy, 250 lb bbls.....lb.	.. ..	.50	.....	.50	.....	.50	.50	.50
Peroxide, 100 lb cs.....lb.	1.00	1.25	1.00	1.25	1.00	1.25	1.25	1.00
Silicofluoride, bbls.....lb.	.09¾	.10¼	.09¾	.10¼	.09¾	.10½	.10½	.09¾
Stearate, bbls.....lb.	.24	.26	.24	.26	.24	.26	.26	.25
Manganese Borate, 30%, 200 lb bbls.....lb.	.....	.19	.....	.19	.....	.19	.19	.19
Chloride, 600 lb casks.....lb.	.07½	.08½	.07½	.08½	.07½	.08½	.08½	.07½
Dioxide, tech (peroxide) drs lb.	.03½	.06	.03½	.06	.03½	.06	.06	.03½
Ore, Powdered or granular..								
75-80%, bbls.....lb.	.02½	.03	.02½	.03	.02½	.03	.03	.02½
80-85%, bbls.....lb.	.....	.03½	.....	.03½	.....	.03½	.03½	.03½
85-88%, bbls.....lb.	.04	.04½	.04	.04½	.04	.04½	.04½	.04
Sulfate, 550 lb drs NY.....lb.	.07	.08	.07	.08	.07	.08	.08	.07
Mangrove 55%, 400 lb bbls...lb.	.....	.04	.....	.04	.03½	.04	Nom.	.03½
Bark, African.....ton	24.75	25.00	24.00	25.00	23.00	29.75	33.00	29.75
Marble Flour, bulk.....ton	14.00	15.00	14.00	15.00	14.00	15.00	15.00	14.00
Mercurous chloride .....lb.	.....	.93	.....	.93	.93	2.05	2.05	2.05
Mercury metal..... 76 lb flask	.....	74.50	65.00	74.50	64.00	106.00	124.50	106.00
Meta-nitro-aniline.....lb.	.67	.69	.67	.69	.67	.69	.69	.67
Meta-nitro-para-toluidine 200 lb. bbls.....lb.	1.40	1.55	1.40	1.55	1.40	1.55	1.55	1.50
Meta-phenylene-diamine 300 lb. bbls.....lb.	.80	.84	.80	.84	.80	.84	.84	.80
Meta-toluene-diamine, 300 lb bbls.....lb.	.67	.69	.67	.69	.67	.69	69	.67
Methanol								
Methanol, (Wood Alcohol),....								
95%.....gal.	.33	.35	.33	.35	.33	.37	.48	.35
97%.....gal.	.34	.39	.34	.39	.34	.43	.49	.39
Pure, Synthetic drums cars gal.	.39½	.41½	.39½	.41½	.39½	.42½	.50	.42½
Synthetic tanks.....gal.	.....	.35½	.....	.35½	.35½	.40½	.50	.40½
Methyl Acetate, drums.....gal.	.. ..	Nom.	.....	Nom.	.....	Nom.	Nom.	Nom.
Acetone,.....gal.	.50	.55	.50	.55	50	.70	.77	.65
Anthraquinone,.....lb.	.85	.95	.85	.95	.85	.95	.85	.70
Cellosolve, (See Ethylene Glycol Mono Methyl Ether)	.....	.....	.....	.....	.....	.....	.....	.....
Chloride, 90 lb cyl.....lb.	.45	.45	.45	.45	.45	.45	.45	.45
Furoate, tech., 50 gal. dr., .lb.	.....	.50	.....	.50	.....	.50	.50	.50
Mica, dry grd. bags wks.....lb.	65.00	80.00	65.00	80.00	65.00	80.00	80.00	65.00
Wet, ground, bags wks.....lb.	110.00	115.00	110.00	115.00	110.00	115.00	115.00	110.00
Michler's Ketone, kegs.....lb.	.....	3.00	.....	3.00	.....	3.00	3.00	3.00
Monochlorobenzene, drums see, Chorobenzene, mono.....lb.								
Monomethylparaminosufate 100 lb drums.....lb.	3.75	4 00	3.75	4.00	3.75	4.00	4.00	3.75
Montan Wax, crude, bags.....lb.	.05½	.07	.05½	.07	.05½	.07	.07	.06
Myrobalans 25%, liq bbls.....b	03¾	.04½	.03¾	.04½	.03¾	.04½	.04½	.03¾
50% Solid, 50 lb boxes.....lb.	.05	.05½	.05	.05½	.05	.05½	.05½	.05
J1 bags.....ton	34.00	35.00	34.00	35.00	34.00	35.00	41.00	34.00
J 2 bags.....ton	.....	16.25	15.25	16.25	15.50	22.50	26.50	19.75
R 2 bags.....ton	.....	15.75	14.75	15.75	16.00	20.00	27.50	19.00
Naphtha, v. m. & p. (deodorized) bbls.....gal.	.12	.14	.12	.14	.12	.18	.16	.16
Naphthalene balls, 250 lb bbls wks.....lb.	.03¾	.04¾	.03¾	.04¾	.03¾	.04¾	.05½	.03¾
Crushed, chipped bgs wks..lb.	.....	.04	.....	.04	.....	.04	.04½	.04
Flakes, 175 lb bbls wks.....lb.	.....	.03¾	.....	.03¾	.....	.03¾	.05	.03¾
Nickel Chloride, bbls kegs.....lb.	.18	.20	.18	.20	.18	.21	.21	.20
Oxide, 100 lb kegs NY.....lb.	.37	.40	.37	.40	.37	.40	.40	.37
Salt bbl. 400 bbls lb NY...lb.	.10½	.13	.10½	.13	.10½	.13	.13	.10½
Single, 400 lb bbls NY.....lb.	.10½	.12	.10½	.12	.10½	.12	.13	.10½
Metal ingot .....lb.	.35	.35	.35	.35	.35	.....	.....	.....
Nicotine, free 40%, 8 lb tins, cases.....lb.	1.25	1.30	1.25	1.30	1.25	1.30	1.30	1.25
Sulfate, 10 lb tins.....lb.	.98½	1.20	.98½	1.20	.98½	1.20	1.20	.98½
Nitre Cake, bulk.....ton	11.00	12.00	11.00	12.00	12.00	14.00	18.00	12.00
Nitrobenzene, redistilled, 1000 lb drs wks.....lb.	.09	.09½	.09	.09½	.09	.09½	.09½	.09
Nitrocellulose, c-l-l-cl, wks...lb.	.25	.36	.25	.36	.25	.36	.36	.25
Nitrogenous Material, bulk..unit	1.50	1.55	1.50	1.55	1.50	2.70	3.40	2.50
Nitronaphthalene, 550 lb bbls.lb.	.....	.25	.....	.25	.....	.25	.25	.25
Nitrotoluene, 1000 lb drs wks.lb.	.14	.15	.14	.15	.14	.15	.15	.14
Nutgalls Aleppy, bags.....lb.	.....	.18	.....	.18	.16	.18	.16½	.16
Chinese, bags.....lb.	.17	.18	.17	.18	.17	.18	.13	.12
Oak Bark, ground.....ton	30.00	35.00	30.00	35.00	30.00	35.00	35.00	30.00
Whole.....ton	20.00	23.00	20.00	23.00	20.00	23.00	23.00	20.00
Orange-Mineral, 1100 lb casks NY.....lb.	.10½	.13	.10½	.13	.10½	.13	.13	.11¾
Orthoaminophenol, 50 lb kgs..lb.	2.15	2.25	2.15	2.25	2.15	2.25	2.25	2.15
Orthoanisidine, 100 lb drs.....lb.	2.50	2.60	2.50	2.60	2.50	2.60	2.60	2.50
Orthochlorophenol, drums.....lb.	.50	.65	.50	.65	.50	.65	.65	.50
Orthocresol, drums.....lb.	.18	.22	.18	.22	.18	.25	.35	.18
Orthodichlorobenzene, 1000 lb drums.....lb.	.07	.10	.07	.10	.07	.10	.10	.07
Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	.28	.29	.28	.29	.28	.33	.33	.30
Orthonitrotoluene, 1000 lb drs wk.....lb.	.16	.18	.16	.18	.16	.18	.18	.16
Orthonitrophenol, 350 lb dr...lb.	.85	.90	.85	.90	.85	.90	90	.85
Orthotoluidine, 350 lb bbl lc-l lb.	.20	.22	.20	.22	.25	.30	.30	.25

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - March 1932 $1.59

which practice was inaugurated in 1926. The last figures available are for January, 1932, during which month the total reached 79,443 metric tons K20, as compared with 116,047 in January, 1931. While no figures are available for February the syndicate stated that there was a decided improvement in trade and that sales exceeded the level of the corresponding month of 1931. Although certain potash mines shut down in the spring season for several months, it is reported that the decrease in potash sales during the present season has made earlier closing necessary for this year. Two large mines of the Preussag concern and the potash works at Aschersleben will close soon for an indefinite period. The closing of these three mines will release over 1,000 workmen.

Potash Caustic — Despite continued hand-to-mouth buying on the part of most consumers the market remained firm and unchanged. Germany's caustic potash exports have averaged 30,000 metric tons annually since 1925. In 1929 the maximum figure of 38,100 tons was reached, but dropped back to approximately 32,000 tons in 1930 and 1931.

Potassium Chlorate — Some signs of improvement were apparent in shipments going to the match producers, but aside from this, the market was inactive. Prices are being firmly held.

Rosin — A slight reaction during the past month destroyed part of the gains made in the previous month but this was more or less anticipated and producing centers are in a better frame of mind. Statistics released by the Department of Commerce indicated that the total exports of domestic naval stores during February amounted to $746,536 as compared with $601,443 for the month last year. Thus a gain of about $145,000, or roughly 25 per cent, was recorded. Gum rosin shipments rose to 59,685 barrels, valued at $336,896 from 36,414 barrels, worth $310,953, while exports of turpentine increased to 586,659 gallons from 298,345 the year before, with respective values of $212,932 and $133,238. Wood turpentine shipments showed a small decrease in quantity and value, but those of wood rosins fell moderately in volume but very sharply in value. Exports of other gums and rosins were up to $140,811 from $63,988 in February, 1931. For the first two months of the year the naval stores shipments amounted to $1, 755,666, as against $1,840,331 last year. In this period exports of rosins amounted to 167,253 barrels, valued at $959,279, as against 97,974 barrels with a value of $825,680. Gum spirit shipments, on the other hand, were 1,316,181 gallons, against

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Orthonitroparachlorphenol, tins ....lb.	.70	.75	.70	.75	.70	.75	.75	.70
Osage Orange, crystals.......lb.	.16	.17	.16	.17	.16	.17	.17	.16
51 deg. liquid.............lb.	.07	.07½	.07	.07½	.07	.07½	.07½	.07
Powdered, 100 lb bags.....lb.	.14½	.15	.14½	.15	.14½	.15	.15	.14½
Paraffin, refd, 200 lb cs slabs								
123-127 deg. M. P.........lb.	.02⅞	.03	.02⅞	.03	.03¼	.03	.04⅞	.03¼
128-132 deg. M. P.........lb.	.....	.03¼	.....	.03¼	.03¼	.03¼	.06⅜	.03⅜
133-137 deg. M. P. ....lb	.04⅛	.04¾	.04⅛	.04¾	.04⅜	.04¾	.07½	.04⅜
Para Aldehyde, 110-55 gal drs..lb.	.20½	.23	.20½	.23	.20½	.23	.23	.20½
Aminoacetanilid, 100 lb bg..lb.	.52	.60	.52	.60	.52	.60	1.05	.52
Aminohydrochloride, 100 lb kegs..........lb	1.25	1.30	1.25	1.30	1.25	1.30	1.30	1.25
Aminophenol, 100 lb kegs..lb.	.78	.80	.78	.80	.82	.86	1.02	.92
Chlorophenol, drums......lb.	.50	.65	.50	.65	.50	.65	.65	.50
Coumarone, 330 lb drums. lb.	.....	.....	.....	.....	.....	.....	.....	.....
Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.25	2.50	2.25	2.50	2.50	2.25
Dichlorobenzene, 150 lb bbls wks...........lb.	.15½	.16	.15½	.16	.15½	.20	.20	.17
Nitroacetanilid, 300 lb bbls.lb.	.45	.52	.45	.52	.45	.55	.55	.50
Nitroaniline, 300 lb bbls wks ....lb.	.48	.55	.48	.55	.48	.55	.55	.48
Nitrochlorobenzene, 1200 lb drs wks..........lb.	.23	26	.23	.26	.23	.26	.26	.23
Nitro-orthotoluidine, 300 lb bbls..........lb.	2.75	2.85	2.75	2.85	2.75	2.85	2.85	2.75
Nitrophenol 185 lb bbls....lb.	.45	50	.45	.50	.45	.50	.50	.45
Nitrosodimethylaniline, 120 lb. bbls..........lb.	.92	.94	.92	.94	.92	.94	.94	.92
Nitrotoluene, 350 lb bbls....lb.	.29	.31	.29	.31	.29	.31	.31	.29
Phenylenediamine, 350 lb bbls ....lb.	1.15	1.20	1.15	1.20	1.15	1.20	1.20	1.15
Tolueneulfonamide, 175 lb bbls..........lb.	.70	.75	.70	.75	.70	.75	.75	.70
Toluenesulfonchloride, 410 lb bbls wks..........lb.	.20	.22	.20	.22	.20	.22	.22	.20
Toluidine, 350 lb bbls wk...lb.	.42	.43	.42	.43	.40	.44	.40	.38
Paris Green, Arsenic Basis								
100 lb kegs..............lb.	.....	.24	.24	.27	.....	.27	.27	.27
250 lb kegs..............lb.	.....	.23	.23	.25	.25	.26	.25	.25
Persian Berry Ext., bbls.....lb.	.25	Nom.	.25	Nom.	.25	Nom.	Nom.	.25
Pentasol (see Alcohol, Amyl)...								
Pentasol Acetate (see Amyl Acetate)								
Petrolatum, Green, 300 lb bbl.lb.	.02	.02⅛	.02	.02⅛	.02	.02⅛	.02⅛	.02
Phenol, 250-100 lb drums.....lb.	.14½	.15	.14½	.15	.14½	.15	.15	.14½
Phenyl - Alpha - Naphthylamine, 100 lb kegs..........lb.	.....	1.35	.....	1.35	.....	1.35	1.35	1.35
Phenylhydrazine Hydrochloride ....lb.	2.90	3.00	2.90	3.00	2.90	3.00	3.00	2.90

Phosphate

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Phosphate Acid (see Superphosphate)								
Phosphate Rock, f.o.b. mines								
Florida Pebble, 68% basis..ton	3.10	3.25	3.10	3.25	3.10	3.25	3.15	3.00
70% basis...............ton	3.75	3.90	3.75	3.90	3.75	3.90	4.00	3.75
72% basis...............ton	4.25	4.35	4.25	4.35	4.25	4.35	4.50	4.25
75-74% basis............ton	5.25	5.50	5.25	5.50	5.25	5.50	5.50	5.25
75% basis...............ton	.....	5.75	.....	5.75	.....	5.75	5.75	5.75
77-80% basis............ton	.....	6.25	.....	6.25	.....	6.25	6.25	6.25
Tennessee, 72% basis.....ton	.....	5.00	.....	5.00	.....	5.00	5.00	5.00
Phosphorous Oxychloride 175 lb cyl..........lb.	.18	.20	.18	.20	.18	.20	.25	.18
Red, 110 lb cases........lb.	.43	.46	.43	.46	.42	.46	.42	.37½
Yellow, 110 lb cases wks..lb.	.31	.37½	.31	.37½	.31	.37½	.37½	.31
Sesquisulfide, 100 lb cs.....lb.	.38	.44	.38	.44	.38	.44	.44	.44
Trichloride, cylinders......lb.	.18	.20	.18	.20	.18	.20	.25	.18
Phthalic Anhydride, 100 lb bbls wks..........lb.	.15	.16	.15	.16	.15	.16	.20	.15
Pigments Metallic, Red or brown bags, bbls, Pa. wks.....ton	37.00	45.00	37.00	45.00	37.00	45.00	45.00	37.00
Pine Oil, 55 gal drums or bbls								
Destructive dist...........lb.	.61	.63	.61	.63	.61	.64	.64	.63
Prime bbls..............bbl.	8.00	10.60	8.00	10.60	8.00	10.60	10.60	8.00
Steam dist. bbls..........gal.	.59	.61	.54	.61	.54	.70	.70	.65
Pitch Hardwood, wks..........ton	35.00	45.00	35.00	45.00	5.00	45.00	45.00	35.00
Plaster Paris, tech, 250 lb bbls ....bbl.	3.30	3.50	3.30	3.50	3.30	3.50	3.50	3.30
Platinum, Refined..........oz.	37.50	38.00	37.50	38.00	38.00	38.00	....	.....

Potash

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Potash, Caustic, wks, solid...lb.	.06¼	.06⅜	.06⅛	.06⅜	.06¼	.06⅜	.06⅜	.06¼
flake..................lb.	.0705	08	.0705	.08	.0705	.08	.08	.0705
Potash Salts, Rough Kainit								
12.4% basis bulk.......ton	.....	9.20	.....	9.20	.....	9.20	9.20	9.10
14% basis..............ton	.....	9.70	.....	9.70	.....	9.70	9.70	9.60
Manure Salts..................								
20% basis bulk.........ton	.....	12.65	.....	12.65	.....	12.65	12.65	12.50
30% basis bulk.........ton	.....	19.15	.....	19.15	.....	19.15	19.15	18.95
Potassium Acetate..........lb.	.27	.28	.27	.28	.27	.30	.30	.27
Potassium Muriate, 80% basis bags..........ton	.....	37.15	.....	37.15	.....	37.15	37.15	36.75
Pot. & Mag. Sulfate, 48% basis bags..........ton	.....	27.80	.....	27.80	.....	27.80	27.80	27.50
Potassium Sulfate, 90% basis bags..........ton	.....	48.25	.....	48.25	....	48.25	48.25	47.75
Potassium Bicarbonate, USP, 320 lb bbls..........lb.	.07⅜	.09	.07⅜	.09	.07⅜	.10	.10	.09½
Bichromate Crystals, 725 lb casks..........lb.	.08	.08½	.08	.08½	.08	.09	.09½	.08⅜
Powd., 725 lb cks wks....lb.	.13	.13½	.13	13¼	.13	.13	.13½	.13

Prices Current and Comment

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1,360,421 last year, with values of $475,705 and $559,874. Wood rosin shipments were vastly less in value, as were those of steam distilled turpentine. Exports of miscellaneous gums and rosins appeared practically on a par for the first two months of 1932 and 1931.

Salt Cake — Continued curtailed activity in both the glass and paper industries prevents any improvement in the market for this commodity. Exports of sodium sulfate in 1931 totaled 4,652 short tons, valued at $75,784, compared with 4,436 tons, valued at $113,253, in 1930. Under the new classification for 1931 niter cake exports totaled 13,351 short tons, valued at $147,901.

Sodium Bichromate — Most of the large consuming industries were still taking shipments in less than usual quantities although a slight improvement was reported from the paint and dry color manufacturers. Prices are being firmly held at the present levels. Considerable interest in producing and consuming channels was aroused over the announcement that the control of the chief chrome interests in the Transvaal Province, owned by the Chrome Corporation of South Africa (Ltd.), has been recently sold to the African Chrome Mines (Ltd.), at a price reported to have been £12,000 sterling. The African Chrome Mines (Ltd.), with its subsidiaries, is generally referred to as the "Chrome Trust" and is said to control roughly 85 per cent of the world's output. Principal centers of operation are in Southern Rhodesia, India, and New Caledonia. The Transvaal firm, deemed one of the Union's most promising base metal concerns, produced in 1929, according to official statistics, between 60,000 and 70,000 tons of chrome ore.

Sodium Chlorate — Some improvement in demand was already in evidence for seasonal consumption. Prices are firm and unchanged. German exports of sodium chlorate in 1931 registered about 3,300 metric tons, a decline from about 6,000 tons in 1930. The largest of the 1931 consignments were as indicated to the following countries in metric tons: United States 1,013, Great Britain 359, Denmark 269, Netherlands 255, Austria 175, Belgium 163, Sweden 154.

Sodium Phosphates — A slight reduction in activity in the silk weighting centers was reflected in the shipments for the disalt. Withdrawals of tri-sodium phosphate are fair and are expected to show further improvement in the near future. Prices are being fairly well maintained in both commodities. The principal industrial phosphates imported are ammonium and sodium phosphates. Imports of the

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Binoxalate, 300 lb bbls.....lb.	.14	.17	.14	.17	.14	.17	.17	.14
Bisulfate, 100 lb kegs......lb.	.16	.30	.16	.30	.16	.30	.30	.30
Carbonate, 80-85% calc. 800 lb casks..............lb.	.048	.05	.04¾	.05	.04¾	.07½	.05¾	.05¾
Chlorate crystals, powder 112 lb keg wks...........lb.	.08	.08½	.08	.08½	.08	.08½	.09	.08
Chloride, crys bbls.........lb.	.04	.04¾	.04	.04¾	.04	.06	.06	.05½
Chromate, kegs...........lb.	.23	.28	.23	.28	.23	.28	.28	.23
Cyanide, 110 lb. cases.....lb.	.55	.57½	.55	.57½	.55	.57½	.57½	.55
Metabisulfite, 300 lb. bbl...lb.	.11	.13	.11	.13	.11	.13	.13	.12
Oxalate, bbls.............lb.	.20	.24	.20	.24	.20	.24	.24	.20
Perchlorate, casks wks.....lb.	.09	.11	.09	.11	.09	.12	.12	.11
Permanganate, USP, crys 500 & 100 lb drs wks........lb.	.16	.16½	.16	.16½	.16	.16½	.16½	.16
Prussiate, red, 112 lb keg...lb.	.....	.38½	.....	.38½	.35	.40	.40	.38
Yellow, 500 lb casks.....lb.	.18½	.21	.18½	.21	.18½	.21	.21	.18½
Tartrate Neut, 100 lb keg..lb.	.....	.21	.....	.21	.....	.21	.21	.21
Titanium Oxalate, 200 lb bbls ....lb.	.21	.23	.21	.23	.21	.23	.23	.21
Propyl Furoate, 1 lb tins.....lb.	.....	5.00	.....	5.00	.....	5.00	5.00	5.00
Pumice Stone, lump bags.....lb.	.04	.05	.04	.05	.04	.05	.05	.04
250 lb bbls..............lb.	.04½	.06	.04½	.06	.04½	.06	.06	.04½
Powdered, 350 lb bags.....lb.	.02½	.03	.02½	.03	.02½	.03	.03	02½
Putty, commercial, tubs..100 lb.	2.35	2.45	2.35	2.45	2.35	2.45	.03½	.03½
Linseed Oil, kegs......100 lb.	4.00	4.75	4.00	4.75	4.00	4.75	.05½	.05½
Pyridine, 50 gal drums......gal.	1.50	1.75	1.50	1.75	1.50	1.75	1.75	1.50
Pyrites, Spanish cif Atlantic ports bulk.............unit	.12	.13	.12	.13	.12	.13¾	.13¾	.13
Quebracho, 35% liquid tks....lb.	.02¾	.03	.02¾	.03	.02¾	.04	.04	.02¾
450 lb bbls c-1...........lb.	.03¼	.03¾	.03¼	.03¾	.03¼	.03¾	.03¾	.03¼
35% Bleaching, 450 lb bbl .lb.	.04	.05¼	.04	.05¼	.04	.05½	.04¾	.05¼
Solid, 63%, 100 lb bales cif..lb.	.....	.02½	.....	.02½	.02½	.05½	.05½	.05
Clarified, 64%, bales.....lb.	.....	.03⅛	.....	.03⅛	.03⅛	.05⅜	.05⅜	.05⅜
Quercitron, 51 deg liquid 450 lb bbls.................lb.	.05½	.06	.05½	.06	.05½	.06	.06	.05½
Solid, 100 lb boxes.........lb.	.09½	.13	.09½	.13	.09½	.13	.13	.09½
Bark, Rough...........ton	.....	14.00	.....	14.00	.....	14.00	14.00	14.00
Ground...............ton	34.00	35.00	34.00	35.00	34.00	35.00	35.00	34.00
R Salt, 250 lb bbls wks......lb.	.40	.44	.40	.44	.40	.44	.45	.40
Red Sanders Wood, grd bbls..lb.	.....	.18	.....	.18	.....	.18	.18	.18
Resorcinol Tech, cans........lb.	.65	.70	.65	.70	.65	1.25	1.25	.90
Rosin Oil, 50 gal bbls, first run ....gal.	.43	.45	.43	.45	.47	.58	.58	.56
Second run............gal.	.47	.49	.47	.51	.51	.61	.61	.59

Rosin

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Rosins 600 lb bbls 280 lb...unit ex. yard N. Y.								
B........................	3.35	3.40	3.30	3.40	3.25	4.95	7.75	5.35
D........................	....	3.60	3.40	3.60	3.35	5.50	8.00	5.50
E........................	3.85	3.95	3.55	3.95	3.45	5.90	8.17	5.52½
F........................	4.05	4.10	3.80	4.10	3.70	6.20	8.45	5.55
G........................	.....	4.10	3.85	4.10	3.75	6.25	8.45	5.60
H........................	4.15	4.20	3.90	4.20	3.80	6.30	8.55	5.60
I........................	.....	4.20	3.95	4.20	3.85	6.35	8.58	5.62½
K........................	.....	4.55	4.35	4.55	4.10	6.45	8.65	5.62½
M........................	4.95	5.00	4.75	5.10	4.20	6.70	8.80	5.65
N........................	5.85	5.90	5.50	5.90	4.85	6.95	8.95	6.05
WG......................	5.95	6.00	5.95	6.45	6.15	8.15	9.25	6.85
WW......................	6.05	6.15	6.05	6.55	6.45	8.90	9.85	7.85
Rotten Stone, bags mines....ton	24.00	20.00	24.00	20.00	24.00	20.00	30.00	18.00
Lump, imported, bbls......lb.	.05	.07	.05	.07	.05	.07	.07	.05
Selected bbls.............lb.	.09	.12	.09	.12	.09	.12	.12	.09
Powdered, bbls...........lb.	.02	.05	.02	.05	.02	.05	.05	.02
Sago Flour, 150 lb bags......lb.	.04½	.05	.04½	.05	.04½	.05	.05	.04½
Sal Soda, bbls wks.......100 lb.	.....	1.00	.....	1.00	.....	1.00	1.00	1.00
Salt Cake, 94-96% c-1 wks. .ton	14.00	15.50	14.00	15.50	14.00	19.00	24.00	15.50
Chrome ....ton	13.00	14.50	13.00	14.50	13.00	17.00	25.00	14.50
Saltpetre, double refd granular 450-500 lb bbls..........lb.	.06½	.06¾	.06½	.06¾	.06	.06¾	.06¾	.06½
Satin, White, 500 lb bbls.....lb	.....	.01½	.....	.01½	.....	.01½	.01½	.01⅛
Shellac Bone dry bbls........lb.	.22	.23	.22	.26	.26	.29	.47	.28
Garnet, bags.............lb.	.19	.20	.19	.20	.19	.26	.40	.24
Superfine, bags............lb.	.13½	.14	.13½	.14	.16	.22	.39	.20
T. N. bags...............lb.	.12	.13	.12	.13	.14½	.17	.34	.18
Schaeffer's Salt, kegs.........lb.	.48	.50	.48	.50	.53	.57	.57	.53
Silica, Crude, bulk mines....ton	8.00	11.00	8.00	11.00	8.00	11.00	11.00	8.00
Refined, floated bags......ton	22.00	30.00	22.00	30.00	22.00	30.00	30.00	22.00
Air floated bags.........ton	.....	32.00	.....	32.00	.....	32.00	32.00	32.00
Extra floated bags.......ton	32.00	40.00	32.00	40.00	32.00	40.00	40.00	32.00
Soapstone, Powdered, bags f. o. b. mines.................ton	15.00	22.00	15.00	22.00	15.00	22.00	22.00	15.00

Soda

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Soda Ash, 58% dense, bags c-1 wks................100 lb.	.....	1.17½	.....	1.17½	.....	1.17½	1.40	1.40
58% light, bags.......100 lb.	.....	1.15	.....	1.15	.....	1.15	1.34½	1.34½
Contract, bags c-1 wks.100 lb.	.....	1.15	.....	1.15	1.15	1.15	1.32	1.32
Soda Caustic, 76% grnd & flake drums.............100 lb.	.....	2.90	.....	2.90	.....	2.90	3.35	3.00
76% solid drs.........100 lb.	.....	2.50	.....	2.50	.....	2.50	2.95	2.90
Sodium Acetate, tech....450 lb. bbls wks...............lb.	.04½	.05	.04½	.05	.04½	.06	.05½	.04
Arsenate, drums..........lb.	.25	.35	.25	.35	.25	.35	.19	.18
Arsenite, drums..........gal.	.50	.75	.50	.75	.50	.75	1.00	.50
Bicarb, 400 lb bbl......100 lb.	.....	2.25	.....	2.25	2.35	2.35	2.41	2.41

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - March 1932 $1.59

former reached the maximum figure of the past decade in 1926 when they totaled 221 short tons, declining gradually to about 21 tons in 1930. Sodium phosphate imports, chiefly di- and tri-, also declined in recent years from about 9,000 tons in 1927-1929 to 733 tons in 1931.

Synthetic Dyes — Seasonal curtailment in several branches of the textile industry brought about a decline in the volume of sales. Tanning operations were unimproved from last month. A firm price tone was in evidence despite the reduction in shipments. Imports of synthetic dyes during the month of February amounted to 430,298 pounds and had an invoice value of $367,496, it is reported by the Department of Commerce and the United States Tariff Commission. Imports in the same month last year were 452,477 pounds, valued at $374,511. The total for the first two months of 1932 is 728,565 pounds, valued at $627,974, compared with 634,252 pounds, valued at $533,933, imported during the same period in 1931.

Origin	% Feb., 1932	% Feb., 1931
Germany	73.19	72.90
Switzerland	25.19	25.00
England	1.62	1.42
All other	....	.68

Imports	February, 1932 Pounds	Invoice Value
New York	418,440	$357,476
Newark	6,726	4,913
Boston	5,132	5,107

Imports of aromatic chemicals during February, this year, totaled 7,006 pounds and were valued at $20,520, compared with 3,488 pounds with a value of $4,829 imported during the same month last year. The total for the first two months of this year is 9,416 pounds, valued at $23,371, while that for the corresponding two months of 1931 was 6,866 pounds with a value of $10,637. Medicinals, photographic developers, intermediates, and other coaltar products imported in February amounted to 107,219 pounds and were valued at $80,373, while imports for the same month last year only 62,400 pounds, valued at $42,672. Total imports so far this year have been 144,840 pounds, valued at $105,854, while for the same period of last year they totaled 237,994 pounds and were valued at $84,666. Imports of color lakes during February amounted to 842 pounds and were valued at $406, bringing this year's total to 1,932 pounds, with a value of $1,117.

Tin Salts — With the metal market experiencing fresh declines to new low levels producers of tin crystals, sodium stannate and anhydrous tetrachloride reduced prices. Shipments for silk weighting were smaller in the past month. A cablegram from the Bolivian delegation meet-

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Bichromate, 500 lb cks wks. lb.	.05	.05¾	.05	.05¾	.05	.07½	.07½	.07
Bisulfite. 500 lb bbl wks... lb.	.....	.04	.....	.04	.....	.04	.04	.04
Chlorate, ... wks.. lb.	.05¾	.07¾	.05¾	.07¾	.05¾	.07¾	.08	.05¾
Chloride, technical........ ton	12.00	13.00	12.00	13.00	12.00	13.00	13.00	12.00
Cyanide, 96-98%, 100 & 250 lb drums wks........... lb.	.16	.17	.16	.17	.16	.17	.20	.16
Fluoride, 300 lb bbls wks... lb.	.07	.07½	.07	.07½	.07	.08½	.09	.08½
Hydrosulfite, 200 lb bbls f. o. b. wks................. lb.	.22	.24	.22	.24	.22	.24	.24	.22
Hypochloride solution, 100 lb cbys................ lb.	.....	.05	.....	.05	.....	.05	.05	.05
Hyposulfite, tech, pea cyrs 375 lb bbls wks...... 100 lb.	2.40	3.00	2.40	3.00	2.40	3.00	3.00	2.40
Technical, regular crystals 375 lb bbls wks.... 100 lb.	2.40	2.65	2.40	2.65	2.40	2.65	2.65	2.50
Metanilate, 150 lb bbls.... lb.	.44	.45	.44	.45	.44	.45	.45	.44
Metasilicate, c-l, wks... 100 lb.	.....	4.00	.....	4.00	.....	4.00	.....	.....
Monohydrate, bbls........ lb.	.....	.02½	.....	.02½	.....	.02½	.02½	.02½
Naphthionate, 300 lb bbl... lb.	.52	.54	.52	.54	.52	.54	.57	.52
Nitrate, 92%, crude, 200 lb bags c-1 NY...... 100 lb.	.....	1.73½	.....	1.73½	1.73½	2.07	2.22½	1.99
Nitrite, 500 lb bbls spot.... lb.	.07½	.08	.07½	.08	.07½	.08	.08	.07½
Orthochlorotoluene, sulfonate, 175 lb bbls wks....... lb	.25	.27	.25	.27	.25	.27	.27	.25
Perborate, 275 lb bbls..... lb.	.18	.20	.18	.20	.18	.20	.20	.18
Phosphate, di-sodium, tech. 310 lb bbls....... 100 lb.	2.65	2.75	2.65	2.75	2.50	3.00	3.25	2.65
tri-sodium, tech, 325 lb bbls.............. 100 lb.	.....	3.20	.....	3.20	3.15	3.50	4.00	3.25
Picramate, 100 lb kegs..... lb.	.69	.72	.69	.72	.69	.72	.72	.69
Prussiate, Yellow, 350 lb bbl wks................ lb.	.11½	.12	.11½	.12	.11½	.12	12½	.11½
Pyrophosphate, 100 lb keg.. lb.	.15	.20	.15	.20	.15	.20	.20	.15
Silicate, 60 deg 55 gal drs, wks .... 100 lb.	1.65	1.70	1.65	1.70	1.65	1.70	1.70	1.6
40 deg 55 gal drs, wks .... 100 lb.	.....	.75	.....	.75	.75	1.00	.80	.70
Silicofluoride, 450 lb bbls NY .... lb.	.....	.06	.05½	.06	.04	.04¾	.05½	.04
Stannate, 100 lb drums.... lb.	.17½	.18	.17½	.19	.18	.26	.43	.24
Stearate, bbls............ lb.	.20	.25	.20	.25	.20	.25	.29	.20
Sulfanilate, 400 lb bbls..... lb.	.16	.18	.16	.18	.16	.18	.18	.16
Sulfate Anhyd, 550 lb bbls c-1 wks............ lb.	.02	02¼	.02	.02¼	.02	.02¼	.02¼	.02¼
Sulfide, 80% crystals, 440 lb bbls wks............ lb.	.02¼	.02¼	.02¼	.02¼	.02¼	.02¼	.02¼	.02¼
62% solid, 650 lb drums lc-1 wks............ lb	.03	03½	.03	.03½	.03	.03½	.03½	.03
Sulfite, crystals, 400 lb bbls wks................ lb.	.03	.03½	.03	.03½	.03	.03½	.03½	.03
Sulfocyanide, bbls......... lb.	.28	.35	.28	.35	.28	.35	.35	.28
Tungstate, tech, crystals, kegs .... lb.	.80	.88	.80	.88	.80	.88	.88	.81
Solvent Naphtha, tanks....... wks................ gal.	.26	.28	.26	.28	.24	.38	.40	.30
Spruce, 25% liquid, bbls..... lb.	.....	.01	.....	.01	.01	.01¼	.01¼	.01¼
25% liquid, tanks wks..... lb.	.....	.01	.....	.01	.....	.01	.01	.01
50% powd, 100 lb bag wks lb.	.02	.02½	.02	.02½	.02	.02½	.02½	.02
Starch, powd., 140 lb bags .... 100 lb.	.....	2.67	.....	2.67	2.57	3.20	4.02	3.42
Pearl, 140 lb bags..... 100 lb.	.....	2.57	.....	2.57	2.57	3.00	3.92	3.32
Potato, 200 lb bags........ lb.	.05½	.06	.05½	.06	.05½	.06	.06½	.05½
Imported bags.......... lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½	.06½	.05¾
Soluble................ lb.	.08	.08½	.08	.08½	.08	.08½	.08½	.08
Rice, 200 lb bbls.......... lb.	.09	.10	.09	.10	.09	.10	.10	.09
Wheat, thick bags......... lb.	.06½	.07	.06½	.07	.06½	.07	.07	.06½
Thin bags............. lb.	.09½	10	.09½	.10	.09½	.10	.10	.09½
Strontium carbonate, 600 lb bbls wks................ lb.	.07½	.07½	.07½	.07½	.07½	.07½	.07½	.07½
Nitrate, 600 lb bbls NY.... lb.	.07	.07½	.07	.07½	.07	.09½	.09½	.09
Peroxide, 100 lb drs....... lb.	.....	1.25	.....	1.25	.....	1.25	1.25	1.25

Sulfur

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Sulfur Brimstone, broken rock, 250 lb bag c-1....... 100 lb.	.....	2.05	.....	2.05	.....	2.05	2.05	2.05
Crude, f. o. b. mines...... ton	18.00	19.00	18.00	19.00	18.00	19.00	19.00	18.00
Flour for dusting 99½%, 100 lb bags c-1 NY.... 100 lb.	.....	2.40	.....	2.40	.....	2.40	2.40	2.40
Heavy bags c-1...... 100 lb.	.....	2.50	.....	2.50	.....	2.50	2.50	2.50
Flowers, 100%, 155 lb bbls c-1 NY.............. 100 lb.	.....	3.45	.....	3.45	.....	3.45	3.45	3.45
Roll, bbls lc-1 NY..... 100 lb.	2.65	2.85	2.65	2.85	2.65	2.85	2.85	2.65
Sulfur Chloride, red, 700 lb drs wks................ lb.	.05	.05½	.05	.05½	.05	.05½	.05½	.05
Yellow, 700 lb drs wks..... lb.	03½	.04½	.03½	.04½	.03½	.04½	.04½	.03½
Sulfur Dioxide, 150 lb cyl.... lb.	.07	.07½	.07	.07½	.07	.07½	.07½	.07
Extra, dry, 100 lb cyl...... lb.	.10	.12	.10	.12	.10	.12	.12	.10
Sulfuryl Chloride,......... lb.	.15	.40	.15	.40	.15	.40	65	.10
Talc, Crude, 100 lb bgs NY... ton	12.00	15.00	12.00	15.00	12.00	15.00	15.00	12.00
Refined, 100 lb bgs NY.. ton	16.00	18.00	16.00	18.00	16.00	18.00	18.00	16.00
French, 220 lb bags NY... ton	18.00	22.00	18.00	22.00	18.00	22.00	22.00	18.00
Refined, white, bags.... ton	35.00	40.00	35.00	40.00	35.00	40.00	40.00	35.00
Italian, 220 lb bags NY... ton	40.00	50.00	40.00	50.00	40.00	50.00	50.00	40.00
Refined, white, bags.... ton	50.00	55.00	50.00	55.00	50.00	55.00	55.00	50.00
Superphosphate, 16% bulk, wks.................. ton	.....	8.00	.....	8.00	7.50	9.00	9.50	8.00
Triple bulk, wks......... unit	.....	65	.....	.65	.....	.65	65	.65
Tankage Ground NY....... unit	.....	1.50&10	.....	1.50&10	1.50	3.20&10	4.00&10	3.20&10
High grade f.o.b. Chicago. unit	.....	1.50&10	.....	1.50&10	1.50	3.25&10	3.85&10	3.25&10
South American cif....... unit	.....	2.25&10	.....	2.25&10	2.00	3.40&10	4.25&10	3.40&10
Tapioca Flour, high grade bgs. lb.	.03½	.05	.03½	.05	.03½	.05	.05¾	.03
Medium grade, bags..... lb.	.03	04	.03	04	.03	.04	.04¾	.02½
Tar Acid Oil, 15%, drums.... gal.	.21	.22	.21	.22	.21	.25	.27	.24
25% drums............ gal.	.23	.24	.23	.24	.23	.28	.30	.26

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - March 1932 $1.59

ing of the international committee of tin producers in Paris gives exports for February as follows: Dutch East Indies, 1,567 tons; Nigeria, 245 tons; Bolivia, 1,622 tons; Malaya, 2,217 tons. The committee congratulates the governments of the several producing countries for maintaining their quotas during the first year of restriction. A new cut of 8,420 tons in production was approved. in view of the slack demand for tin. The stock on hand in London is 21,000 tons. The committee's next meeting will be held in London April 22.

Turpentine — The strong position of turpentine prices continued through March. The market level as the month closed was approximately 10c a gallon above the low registered near the close of last year. The statistical position of stocks is reported to be better and while some reaction may take place leading factors in the local market were optimistic on the continuance of the present values. It was officially announced that the large stocks of rosin and turpentine accumulated last year by the Gum Turpentine-Rosin Marketing Association will hereafter be exclusively sold through the Columbia Naval Stores Co. of Savannah. The arrangement has been approved by the Federal Intermediate Credit Bank of Columbia, S. C., which had extended loans in excess of $2,000,000 against the co-operative holdings. Official figures are lacking, but, according to the Naval Stores Review of Savannah, the trade there places them at 45,000 barrels of turpentine and 180,000 barrels of rosin. February production of naval stores by steam distillation and solvent treatment of wood and stocks of these products on hand February 29, according to data collected by the naval stores division of Hercules Powder, were as follows:

Production

	Rosin 500-lb. barrels	Turpentine (Gallons)	Pine oil (Gallons)
Month of February	20,006	156,067	130,046
Total from Apr. 1, 1931	288,538	2,336,985	1,937,461
Stocks at Plants			
Total Feb. 29, 1932	91,762	306,585	1,723,947
Total Mar. 31, 1931	125,919	499,331	1,881,705
Change	-34.157	-192.746	-157.758

Note:—Rosin production and stocks include all grades of wood rosin.

Zinc — The price of the metal declined only slightly in March, the current quotation being $3.17 N. Y. Basis. Buying in most consuming industries is still restricted to the barest needs while stocks on hand fail to show any appreciable amount of decline. February production was only slightly under that for January and is undoubtedly due to the short month. World zinc production in February according to American Bureau of

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Terra Alba Amer. No. 1, bgs or bbls mills.........100lb.	1.15	1.75	1.15	1.75	1.15	1.75	1.75	1.15
No. 2 bags or bbls...100lb.	1.50	2.00	1.50	2.00	1.50	2.00	2.00	1.50
Imported bags............lb.	.01⅛	.01½	.01⅛	.01½	.01⅛	.01½	.01½	.01⅛
Tetrachlorethane, 50 gal dr...lb.	.09	.09½	.09	.09½	.09	.09½	.09½	.09
Tetralene, 50 gal drs wks.....lb.	.....	.20	.....	.20	.....	.20	.20	.20
Thiocarbanilid, 170 lb bbl....lb.	.25	.28½	.25	.28½	.25	.28½	.28½	.22
Tin..............................								
Crystals, 500 lb bbls wks...lb.	.23½	.24	.23½	.24	.23	.28½	.34	.25
Metal Straits NY..........lb.	.....	.22½	.21¾	.22½	.21¾	.27	.38	.26
Oxide, 300 lb bbls wks.....lb.	.....	.23	.....	.23	.23	.29	.42	.25
Tetrachloride, 100 lb drs wks ....lb.	.....	.165	.....	.165	.1605	.19½	.20½	.18½
Titanium Dioxide 300 lb bbl..lb	.20½	.21	.20½	.21	.20½	.22	.50	.21
Pigment, bbls...........lb.	.06¾	.07½	.06¾	.07½	.06¾	.07½	.07½	.06¾
Toluene, 110 gal drs.........gal.	.....	.35	.....	.35	.34	.35	.40	.35
8000 gal tank cars wks....gal.	.....	.30	.....	.30	.27	.30	.35	.30
Toluidine, 350 lb bbls........lb.	.88	.89	.88	.89	.88	.94	.94	.90
Mixed, 900 lb drs wks.....lb.	.27	.32	.27	.32	.27	.32	.32	.27
Toner Lithol, red, bbls.......lb.	.90	.95	.90	.95	.90	.95	.95	.90
Para, red, bbls............lb.	.....	.80	.....	.80	.....	.80	.80	.80
Toluidine ....lb.	1.50	1.55	1.50	1.55	1.50	1.55	1.55	1.50
Triacetin, 50 gal drs wks.....lb.	.32	.36	.32	.36	.32	.36	.36	.32
Trichlorethylene, 50 gal dr...lb.	.10	.10½	.10	.10½	.10	.10½	.10½	.10
Triethanolamine, 50 gal drs...lb.	.40	.42	.40	.42	.40	.42	.42	.40
Tricresyl Phosphate, drs.....lb.	.25½	.26	.25½	.26	.26	.45	.45	.33
Triphenyl guanidine.........lb.	.58	.60	.58	.60	.58	.60	.60	.58
Phosphate, drums.........lb.	.50	.65	.50	.65	.50	.70	.70	.60
Tripoli, 500 lb bbls......100 lb.	.75	2.00	.75	2.00	.75	2.00	2.00	1.75
Tungsten, Wolframite,..per unit	11.00	11.75	11.00	11.75	11.00	11.75	.....	.....
Turpentine carlots, bbls.....gal.	.....	.41½	.39	.41½	.36½	.57	.61½	.41
Wood Steam dist. bbls....gal.	.44	.45	.44	.45	.38	.61	.52	.36
Urea, pure, 112 lb cases......lb	.15	.17	.15	.17	.15	.17	.17	.15
Fert. grade, bags c.i.f.....ton	.. .	82.60	.....	82.60	.....	82.60	108.00	108.00
c. i. f. S. points.........ton	.....	82.60	.....	82.60	.....	82.60	109.30	109.30
Valonia Beard, 42%, tannin bags...................ton	32.00	32.50	32.00	34.00	33.00	40.00	40.00	39.50
Cups, 30-31% tannin.....ton	22.50	23.50	22.50	23.50	22.50	25.00	27.00	24.00
Mixture, bark, bags........ton	25.00	26.00	25.00	26.00	25.00	31.00	32.50	30.00
Vermillion, English, kegs....lb..	1.53	1.80	1.53	1.80	1.53	1.80	2.05	1.75
Vinyl Chloride, 16 lb cyl.....lb.	.....	1.00	.....	1.00	.....	1.00	1.00	1.00
Wattle Bark, bags..........ton	29.00	33.00	29.00	33.00	32.00	41.00	47.75	40.00
Extract 55%, double bags ex-dock...................lb.	.05	.06½	.05	.06½	.05	.06½	.06½	.05½
Whiting, 200 lb bags, c-1 wks ....100 lb.	.85	1.00	.85	1.00	.85	1.00	1.00	1.00
Alba, bags c-1 NY.........ton	.....	13.00	.....	13.00	.....	13.00	13.00	13.00
Gilders, bags c-1 NY...100 lb.	.....	1.35	.....	1.35	.....	1.35	1.35	1.35
Xylene, 10 deg tanks wks. . gal.	.....	.29	.....	.29	.....	.29	.31	.28
Commercial, tanks wks...gal.	.....	.26	.....	.26	.24	.30	.33	.25
Xylidine, crude.............lb.	.36	.37	.36	.37	.36	.37	.38	.37

Zinc

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Zinc Ammonium Chloride powd., 400 lb bbls..........100 lb.	5.25	5.75	5.25	5.75	5.25	5.75	5.75	5.25
Carbonate Tech, bbls NY..lb.	.10½	.11	.10½	.11	.10½	.11	.11	.10½
Chloride Fused, 600 lb drs. wks...................lb.	.05¾	.06	.05¾	.06	.05¾	.06	.06	.05¾
Gran., 500 lb bbls wks.....lb.	.05¾	.06	.05¾	.06	.05¾	.06	.06½	.05¾
Soln 50%, tanks wks...100 lb.	2.25	3.00	2.25	3.00	2.25	3.00	3.00	2.25
Cyanide, 100 lb drums.....lb	.38	.39	.38	.39	.38	.39	.41	.38
Dithiofuroate, 100 lb dr....lb.	.....	1.00	.....	1.00	.....	1.00	1.00	1.00
Dust, 500 lb bbls c-1 wks...lb.	.0505	.0515	.0505	.0525	.0515	.07	.11	.06
Metal, high grade slabs c-1 NY...............100 lb.	3.195	3.21	3.195	3.22½	3.50	4.45	6.45	4.10
Oxide, American bags wks..lb.	.06½	.07	.06½	.07	.06½	.07	.07¾	.06½
French, 300 lb bbls wks...lb.	.09¾	.11¾	.09¾	.11¾	.09¾	.11¾	.11¾	.09¾
Perborate, 100 lb drs......lb.	.....	1.25	.....	1.25	.....	1.25	1.25	1.25
Peroxide, 100 lb drs.......lb.	.....	1.25	.....	1.25	.....	1.25	1.25	1.25
Stearate, 50 lb bbls........lb.	.18½	.22	.18½	.22	.18½	.23	.26	.20
Sulfate, 400 bbl wks.......lb.	.03	.03½	.03	.03½	.03	.03½	.03½	.03
Sulfide, 500 lb bbls........lb.	.13	.13½	.13	.13½	.13	.16½	.32	.16
Sulfocarbolate, 100 lb keg..lb.	.22	.24	.22	.24	.22	.30	.30	.28
Zirconium Oxide, Nat. kegs...lb.	.02½	03	.02½	.03	.02½	.03	.03	.02½
Pure kegs................lb.	.45	.50	.45	.50	.45	.50	.50	.45
Semi-refined kegs.........lb.	.08	.10	.08	.10	.08	.10	.10	.08

Oils and Fats

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Castor, No. 1, 400 lb bbls.....lb.	.....	.10¼	.09¾	.10¼	.10	.12	.13½	.11½
No. 3, 400 lb bbls.........lb	.09¾	.10½	.09¾	.10½	.09½	.11¾	.13	.11
Blown, 400 lb bbls........lb.	.12	.12½	.12	.12½	.12½	.14	.15	.12
China Wood, bbls spot NY...lb.	.07⅝	.07¾	.07	.07¾	.07	.07½	13	.07
Tanks, spot NY.........lb.	.06¾	.06⅞	.06	.06⅞	.06	.07	11⅜	.06
Coast, tanks,...........lb.	.06⅜	.06½	.05⅝	.06½	.05½	.06½	.10⅜	.05½
Cocoanut, edible, bbls NY....lb.	....	.10¾	.....	.10¾	.....	.10¾	.10⅝	.10⅝
Ceylon, 375 lb bbls NY....lb.	.04⅜	.04¾	.04⅜	.04¾	.04⅜	.06½	.08½	.06⅜
8000 gal tanks NY.......lb.	.03¾	.03⅞	.03¾	.03⅞	.03⅜	.06	.07	.05½
Cochin, 375 lb bbls NY....lb.	.05⅛	.06	.05⅛	.06	.05⅛	.07	.09½	.07½
Tanks NY..............lb.	.04¾	.05	.04¾	.05	.04⅜	.05¾	.08½	.07
Manila, bbls NY..........lb.	.04⅜	.05	.04⅜	.05	.04⅜	.07	.08½	.06½
Tanks NY..............lb.	.03⅜	.04	.03⅜	.04	.03⅜	.05⅛	.07⅛	.05⅜
Tanks, Pacific Coast.....lb.	.....	.03½	.....	.03½	.03	.05	.07	.05⅜

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1931 Average $1.404 - Jan. 1931 $1.283 - March 1932 $1.59

Metal Statistics was 76,298 short tons in February compared with 80,609 tons in January, 80,617 in December and 104,191 tons in February, 1931. Daily average production in February was 2,631 tons compared with 2,600 in January, 2,601 in December and 3,721 tons a day in February, 1931. Following table gives in short tons output of zinc by important producing countries unallocated as to origin except in case of United States and Mexico. Zinc smelted in United States from Mexican ore is credited to Mexico.

	Feb.	*Jan.*	*Jan.-Feb.*
United States	21,516	22,516	44,032
Mexico	2,941	2,938	5,879
Canada	7,066	7,478	14,544
Belgium (a)	10,300	11,254	21,554
France	4,303	4,785	9,088
Germany	3,565	3,782	7,347
Italy	1,177	1,221	2,398
Netherlands	1,369	1,422	2,791
Poland (a)	9,400e	9,651	19,051
Spain	816	877	1,693
Anglo-Australian	6,045	6,385	12,430
Elsewhere (b)	7,800	8,300	16,100
World's total	76,298	80,609	156,907
United States	21,516	22,516	44,032
Foreign	54,782	58,093	112,875

(a) Includes salable zinc dust. (b) Partly estimated; includes Norway, Jugoslavia, Czechoslovakia, Russia, Indo-China and Japan. (d) Revised. (e) Estimated.

Zinc Oxide — Both domestic producers and importers of French process zinc oxide made sizable reductions in March. This is the first reduction that has been made in the various grades of this commodity and represents a delayed adjustment of prices to the low level prevailing for the metal and products competitive with zinc oxide in the paint industry. The new schedule is as follows.

Carlots, Bags		
American process, lead free	.05¾	.06½
Leaded 5%	.05½	.06¼
Leaded 10%	.05½	.06¼
Leaded 20%	.05½	.06¼
Leaded 25%	.05½	.06¼
Leaded 35%	.05½	.05¾
French process, red seal	.08⅝	.09⅜
Green seal	.09⅝	.10⅜
White seal	.10⅞	.13

Chinawood Oil — With the practical cessation of warfare in China, at least for the moment, and the return to something like normal condition of shipping chinawood oil prices declined from the recent levels.

Exports from Hankow

	Pounds Total Exports	To United States	To Europe
February, 1932	12,502,000	10,088,000	2,414,000
January, 1932	7,232,000	6,134,000	1,098,000
February, 1931	10,108,000	9,204,000	904,000
Jan.-Feb., 1932	19,734,000	16,222,000	3,512,000
Jan.-Feb., 1931	14,152,000	11,942,000	2,210,000

Hankow Stocks and Prices

	Short Tons	*Price Per Pound*
February, 1932	2,300	$0.053
January, 1932	1,300	0.050
February, 1931	2,340	0.050

Market quotations for tung oil in February at Hankow have been computed by the chemical division of the Bureau of Foreign and Domestic Commerce.

	Open.	*High.*	*Low.*	*Close.*
Taels, per picul	20.10	21.60	20.10	20.30
American Dollars, price per pound	$0.051	$0.053	$0.051	$0.053

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Cod, Newfoundland, 50gal bbls ... gal.	.....	.30	.....	.30	.26	.48	.56	.46
Tanks NY ... gal.	.28	.30	.28	.30	.24	.45	.62	.48
Cod Liver see Chemicals								
Copra, bags ... lb.	.021	.023	.021	.0235	.0195	.0325	.046	.039
Corn, crude, bbls NY ... lb.	.05¾	.09	.05¾	.09	.05¾	.09	.10	.08½
Tanks, mills ... lb.	.03⅝	.03½	.03⅝	.03½	.03⅝	.07½	.08	.06½
Refined, 375 lb bbls NY ... lb.	.06¾	.07	.06¾	.07	.06¾	.10½	.10½	.09½
Tanks ... lb.	.08½	.08¾	.08½	.08¾	.08	.08¾	.10	.08
Cottonseed, crude, mill ... lb.	.03	.03½	.03	.03½	.03	.07	.07½	.06⅛
Degras, American, 50 gal bbls NY ... lb.	.03¼	.04	.03¼	.04	.03¼	.04¼	.04¼	.03½
English, brown, bbls NY ... lb.	.03⅞	.04	.03⅞	.04	.03⅞	.05	.05	.04½
Light, bbls NY ... lb.	.04	.04½	.04	.04½	.04	.05½	.05½	.05
Dog Fish, Coast Tanks ... gal.	.....	.32	.....	.32	.....	32	.34	.32

Greases

	Current Market		1932 Low	1932 High	1931 High	1931 Low	1930 High	1930 Low
Greases, Brown ... lb.	.02	.02¼	.02	.02¼	.02	.04¼	.06⅛	.04
Yellow ... lb.	.02½	.03	.02½	.03	.02	.05	.07½	.03⅞
White, choice bbls NY ... lb	.03¾	.04½	.03¾	.04½	.03½	.05¾	.08½	.06
Herring, Coast, Tanks ... gal.	.....	Nom.	.....	Nom.	.....	Nom.	.....	.....
Horse, bbls ... lb.	.05½	Nom.	.05¼	Nom.	.05¼	Nom.	Nom.	.05½
Lard Oil, edible, prime ... lb.	.09¾	.10	.09¾	.10	.10¾	.13	.13½	.12½
Extra, bbls ... lb.	.06¾	.07	.06¾	.07	.07	.10	.12	.10
Extra No. 1, bbls ... lb.	.06¼	.07	.06¼	.07	.06¼	.09¾	.11	.09¾
Linseed, Raw, five bbl lots ... lb.	.....	.074	.....	.074	.077	.102	.146	.096
Bbls c-1 spot ... lb.	.....	.066	.....	.066	.069	.098	.142	.092
Tanks ... lb.	.....	.06	.....	.06	.063	.092	.134	.086
Menhaden Tanks Baltimore ... gal.	.17½	.20	.17½	.20	.14	.22	.50	.21
Extra, bleached, bbls NY ... gal.	.38	.40	.38	.40	.38	.53	.70	.52
Light, pressed, bbls NY ... gal.	.33	.34	.33	.34	.33	.38	.64	.36
Yellow, bleached, bbls NY ... gal.	.36	.37	.36	.37	.30	.42	67	.38
Mineral Oil, white, 50 gal bbls ... gal.	.40	.60	.40	.60	.40	.60	.60	.40
Russian, gal ... gal.	.95	1.00	.95	1.00	.95	1.00	1.00	.95
Neatsfoot, CT, 20° bbls NY ... lb.	.13¼	.13½	.13¼	.13½	.13¼	.16	.17⅛	.16¼
Extra, bbls NY ... lb	.06½	.06¾	.06½	.07	.07	.10	.11⅛	.09½
Pure, bbls NY ... lb.	.08¾	.09	.08¾	.09	.09½	.12	.13⅛	.11½
Oleo, No. 1, bbls NY ... lb.	.06⅝	.07	.06⅝	.07	.06⅝	.08	.12½	.08⅛
No. 2, bbls NY ... lb.	.05⅝	.06	.05⅝	.06	.05¾	.08	.11	.08⅛
No. 3, bbls NY ... lb.	.....	.06¾	.....	.06¾	.06¾	.09	.10½	.09
Olive, denatured, bbls NY ... gal.	.63	.65	.62	.65	.59	.80	1.00	.70
Edible, bbls NY ... gal.	1.65	2.00	1.65	2.00	1.50	2.00	2.00	1.75
Foots, bbls NY ... lb.	.....	.05	.04½	.05	.04½	.06¾	.08	.06
Palm, Kernel, Casks ... lb.	.....	.04⅞	.03⅞	.04⅞	.04⅛	.06½	.08¼	.06
Lagos, 1500 lb casks ... lb.	.04	.05	.04	.05	.04	.06	.07⅞	.05⅞
Niger, Casks ... lb.	.03⅝	.03½	.03⅝	.03½	.03½	.05½	.07½	.05⅛
Peanut, crude, bbls NY ... lb.	.03¾	.04	.03¾	.04	.03¾	.05	Nom.	.....
Refined, bbls NY ... lb.	.08½	.09	.08½	.09	.08½	.14	.15	.12
Perilla, bbls NY ... lb.	.05¾	.05½	.05¼	.05¾	.05½	.11	.14½	.10
Tanks, Coast ... lb.	.....	.05	.....	.05	.05	.09	.11½	.08
Poppyseed, bbls NY ... gal.	1.70	1.75	1.70	1.75	1.70	1.75	1.75	1.70
Rapeseed, blown, bbls NY ... gal.	.68	.70	.68	.70	.68	.73	1.00	.74
English, drms. NY ... gal.	.....	.75	.....	.75	.....	.75	.82	.75
Japanese, drms. NY ... gal.	.56	.58	.56	.58	.56	.58	.70	.56
Red, Distilled, bbls ... lb.	.06½	.06⅝	.06½	.07	.07⅛	.09	.10⅛	.08⅛
Tanks ... lb.	.05¾	.06	.05¾	.06	.06½	.08½	.09½	.07¾
Salmon, Coast, 8000 gal tks. ... gal.	.....	.19	.....	.19	.19	.22	.44	.42
Sardine, Pacific Coast tks ... gal.	.17	.17½	.17	.17½	.17	.19	.42	.18
Sesame, edible, yellow, dos ... lb.	.08½	.09	.08½	.09	.08½	.10¾	.12	.09
White, dos ... lb.	.10	.11	.10	.11	.10	.12	.12½	.10
Sod, bbls NY ... gal.	.....	.40	.....	.40	.....	.40	.40	.40
Soy Bean, crude								
Pacific Coast, tanks ... lb.	.03	.03½	.03	.03½	.03⅛	.08	.09¼	.07
Domestic tanks, f.o.b. mills, ... lb.	.....	.03	.03	.032	.032	.07	.08⅛	.07
Crude, bbls NY ... lb.	.04¾	.05	.04¾	.05	.04¾	.08	.10¾	.10
Tanks NY ... lb.	.04¼	.04½	.04¼	.04½	.04½	.08	.09¾	.09
Refined, bbls NY ... lb.	.058	.06	.058	.06	.058	.09	.13½	.13
Sperm, 38° CT, bleached, bbls NY ... gal.	.68	.70	.68	.70	.68	.8[illegible]	.85	.84
45° CT, bleached, bbls NY ... gal.	.63	.65	.63	.65	.63	.80	.80	.79
Stearic Acid, double pressed dist bags ... lb.	.08½	.09	.08½	.09	08½	.11	.15	.13½
Double pressed saponified bags ... lb.	.07	.07½	.07	.07½	.08	.12	.15½	.14½
Triple, pressed dist bags ... lb	.10¾	.11	.10¾	.11	.11	.14	.17	.15½
Stearine, Oleo. bbls ... lb.	.05½	.06	.05½	.06	.05½	.08¾	.09½	.08½
Tallow City, extra loose ... lb.	.03⅛	.03⅜	.03⅛	.03⅜	.02⅞	.04	.07⅜	.04¾
Edible, tierces ... lb.	.03⅞	.04	.03⅞	.04	.03⅞	.06	.09¼	.05½
Tallow Oil, Bbls, c-1 NY ... lb.	.07	.07½	.07	.07½	.07	.08¾	.11	.08½
Acidless, tanks NY ... lb.	.07⅞	.09	.07⅞	.09	.07⅞	.09	.10	.08¼
Vegetable, Coast mats ... lb.	.06	Nom.	.06	Nom.	.06½	Nom.	Nom.	.06½
Turkey Red, single bbls ... lb.	.07	.09	.07	.09	.07	.10	.12	.10
Double, bbls ... lb.	.09	.11	.09	.11	.09	.10	.16	.13
Whale, bleached winter, bbls NY ... gal.	.....	.74	.....	.74	.....	.74	.74	.74
Extra, bleached, bbls NY ... gal.	.58	.60	.58	.60	.58	77½	.76	.76
Nat. winter, bbls NY ... gal.	.53	.55	.53	.55	.53	72	.73	.73

Index to Advertisers

"We"—Editorially Speaking

"Managements," says a technical journal's recent editorial "have sliced budgets beyond the evaporation point of economy" —an Hibernian thought that should be followed up with an erudite article on the surface tension of red ink.

Dr. Downs whose subject "Capital Costs" vs. "Labor Costs" is one that will appeal to all classes of readers although from many different angles. Dr. Downs is a technical man one accustomed to, going to the root of any problem in the most direct way. The habits of the ostrich sticking its head in the sand, thereby, hoping to gain concealment, has no part in Dr. Downs makeup. He recognizes that there is a problem of technological unemployment; that the problem bids to become more serious as time goes on. He surveys the problem of technological unemployment for the executives of the chemical industry from the viewpoint of a man who understands its causes and foresees its effect.

"But one must eat"—and the Chemists, Club served 4,486 meals in February, 1932' against 4,334 in 1931.

We sent a foreign inquiry to a small, but well-known chemical manufacturer last week and in a burst of gratitude the president entered a subscription for a year. This just balances the personal subscription of this man cancelled the week before last for "non-payment of account."

Ballyhoo saves the chemists—for, if there are really so few chemists out of employment as the American Chemical Society claims, any members out of work ought easily to find a place in "Ballyhoo's $5,000,000 Research Laboratory" whose foundation is announced on a two page spread in the current issue of that enterprising magazine.

All subtle tactics of the interviewer signally failed to elicit from Dr. Gann one word about the important part he played in the commercial development of magnesium manufacture during his recent visit to New York when he addressed the American Institute of Mining and Metallurgical Engineers. His reticence fortunately is not shared by his co-workers. Often his "we" really should be "I". His paper has been divided into two parts, the first appearing in this issue dealing with the development of the process at Midland and present manufacturing methods, and the second with uses and future possibilities. Dr. Gann, a graduate of Case, received his master's degree at M. I. T., and his doctor's degree at Gottingen. Returning to this country he served as chief chemist of Rohm & Haas for three years before going to Midland in 1918 to take up the problem of producing magnesium in commercial quantities.

While preliminary financial reports of the industrial chemical group seemed to indicate a decline of some 30 or 35 per cent in earnings in 1931, final figures of very representative companies show a much better situation. Net income of this group amounted to $76,300,000 which is only 16 per cent below $90,907,000, the corresponding figure in 1930. Industrial earnings are off approximately 50 per cent so that by comparison the chemical industry appears in a favorable light in times which generally are not so favorable. Twelve of the leading chemical companies' common stocks are now selling at an average of only 11½ times their earnings. Despite the nightmare of rapid depreciation and obsoletion there appear to be many bargains on the counters for those with faith and vision.

Our revered contemporary "Chem & Met" considers a balance sheet "a prosaic document"—ho hum!

Marcel Leveugle who shows in this issue that the value of gold is very changeable, and that in any exhaustive study of international trade statistics this fact must be given due consideration, is a graduate of the University of Commerce and Industry, Paris, where he devoted much time to the study of the European chemical trade situation. He later became connected with the Rhone-Poulence, a French chemical producing company, in sales promotion work. Coming to this country a few years ago Mr. Leveugle became associated with the Paispearl Products, Inc., a firm formed to exploit a process for the manufacture of artificial pearls from fish scale and was in charge of production at the factory established in Maine. He is the author of a book on the contribution of the United States to the economic side of chemical industry to be published shortly by "l'Industrie Chimique" of Paris.

COMING FEATURES

Borax
Magnesium
Cellulose Ethers
Activated Carbon
Hydrocyanic Acid
Carbon Tetrachloride
Propane and Butane

A wide range of chemical products that are going to be covered in articles by authorities in our coming issues.

"What is the most outstanding contribution that chemistry has given to the world ?"

"Blondes."—***American Fertilizer.***

A trip to a stock brokerage house these days is a most depressing experience. Expensive customers' rooms provided for "wiley" speculators are singularly vacant. Keyed up to an unnatural demand Wall Street finds that the public is "no longer interested in the market." How can we reconcile these statements with the fact that an increase of 7,800 stockholders in the year 1931, or 22.6 per cent, raised the direct owners of the du Pont company's common stock to 42,000 ? Once again America is looking to the investment return and not a quick turn-over. Which is as it should be.

Neon signs and snails would appear to have little in common, yet they both presented exceptional difficulties to the railroads when recently asked to move them. The problem of the neon filled advertising signs was solved by fastening them to frames of chicken wire, which in turn were suspended by strips of old innertubes inside a solid box. The snails? They are neither acid or alkali, solvent or thinner, they show no reaction to litmus paper, so why bother.

The elements composing the flapper have been definitely established by chemists as being brimstone, alcohol and talcum powder.—*Harry Carr.*